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FLORA OF GUATEMALA

PAUL C. STANDLEY

and

LOUIS O. WILLIAMS

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FIELDIANA: BOTANY

VOLUME 24, PART XI, NUMBERS 1 to 3

Published by

FIELD MUSEUM OF NATURAL HISTORY

June 16, 1975

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FLORA OF GUATEMALA

PART XI, NOS. 1 TO 3

FLORA OF GUATEMALA

PAUL C. STANDLEY

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RUBIACEAE. Madder Family

PAUL C. STANDLEY AND LOUIS O. WILLIAMS

Reference: Standley, No. Am. Fl. 32: 1-300. 1918-34 (this treatment covers only part of the family, but is the latest account treating the genera and species of Central America).

Herbs, shrubs or trees, erect, prostrate, or rarely scandent, sometimes armed with spines; leaves simple, opposite or verticillate, entire (in all Guatemalan representatives except one), rarely pinnatifid; stipules present, interpetiolar or intrapetiolar, persistent or deciduous, entire or often lobate or dentate or setiferous, frequently connate to form a sheath, rarely (in Galieae) foliaceous and resembling leaves; inflorescence various, usually cymose, sometimes capitate, often paniculate, the hypanthia rarely adnate and forming a syncarp; flowers typically perfect, sometimes unisexual, commonly regular and symmetric, frequently dimorphous; hypanthium adnate to the ovary; calyx cupular, tubular, or nearly obsolete, persistent or deciduous, entire, dentate, or lobate, the lobes often unequal, one of them sometimes foliaceous; corolla gamopetalous and funnelform, salverform, campanulate, rotate, or rarely urceolate or tubular, glabrous or pubescent within, the limb usually symmetric, its lobes valvate, imbricate, or contorted in bud; stamens usually as many as the corolla lobes and alternate with them, inserted in the tube or throat of the corolla; filaments short or elongate, often suppressed; anthers usually oblong-linear, 2-celled, dehiscent by anterior or lateral slits or rarely by pores, dorsifixed or basifixed; disk annular, pulvinar, hemispheric, or conic; ovary 1-10-celled, the style short or elongate, simple or 2-10-fid, the branches filiform, linear, or spatulate; placentae affixed to the septum or to the interior angle of the cell, or basilar, or pendulous from the apex of the cell; ovules solitary, geminate, or numerous, superficial or immersed in the placentae, erect, horizontal, ascending, or pendulous; fruit capsular, baccate, or drupaceous, or of dehiscent or indehiscent cocci, 2-10-celled, rarely 1-celled; seeds variable in form and size, the testa usually membranaceous or coriaceous, smooth or roughened, often winged or appendaged.

One of the largest families of plants, represented in almost all parts of the earth, but most abundantly in the tropics. In most countries of Central and South America it stands among the first three or four families in number of species. A very few genera

besides those listed here are represented in southern Central America, particularly Costa Rica and Panama.

The senior author of this flora specialized in the family for many years and knew a great deal about the American Rubiaceae. He never found the time to study the tribal arrangement of the genera and, in fact, had little interest in the tribes other than as convenient receptacles for the genera as he knew them.

The key to the tribes presented here is much like that in the preliminary manuscript that Standley wrote 30 years ago. Names of tribes, in two cases, have been changed to make them conform to correct nomenclature and the Hamelieae has been separated out of the Gardenieae. Several genera have been added to the flora since Standley's day and many additional species are added to the known flora, based upon our intensive collections in Guatemala over the last 20 years.

KEY TO THE TRIBES AND GENERA OF RUBIACEAE

Ovules more than one in each cell. (Subfam. *Cinchonoideae*).

Fruit fleshy, baccate.

Corolla lobes valvate in bud.....VI. *Mussaendeae*.

Corolla lobes imbricate or contorted in bud.

Corolla lobes imbricated in the bud.....VIII. *Hamelieae*.

Corolla lobes contorted in the bud.....VII. *Gardenieae*.

Fruit dry, capsular.

Flowers arranged in very dense and compact, spherical heads; shrubs or trees.

V. *Naucleaeae*.

Flowers variously disposed, but never in spherical heads.

Seeds winged or appendaged, vertically imbricateIV. *Cinchoneae*.

Seeds not winged or, if so, horizontal.

Corolla lobes imbricate or contorted in bud; shrubs or trees.

III. *Rondeletieae*.

Corolla lobes valvate in bud.

Seeds horizontal, usually very numerous; stipules entire or biparted; large shrubs or trees with usually large leaves.....I. *Condamineae*.

Seeds imbricate, vertical, usually few; stipules often setose-laciniate; herbs or very small shrubs with small leavesII. *Oldenlandieae*.

Ovules solitary in the cells: Subfam. *Rubioideae*, except *Naucleaeae*.

Seeds pendulous in the cell, the radicle superior; shrubs or trees.

Flowers in compact globose heads.....V. *Naucleaeae*.

Flowers never in globose heads.

Stamens inserted in the throat of the corolla.....IX. *Guettardeae*.

Stamens inserted at the base of the corolla tube or on discX. *Chiococceae*.

Seeds ascending, the radicle inferior; plants woody or herbaceous.

Corolla lobes contorted in bud; shrubs or trees.....XI. *Ixoreae*.

Corolla lobes valvate in bud.

Ovules basilar, attached at the base of the cell; mostly shrubs or trees.

Ovary 1-celled, or 2-celled but with a very thin septum, the fruit 1-seeded.

XIV. *Coussareae*.

Ovary 2-celled, or the cells rarely more numerous, the septum thick.

Stamens usually inserted in the throat of the corolla; flowers perfect.

XII. *Psychotrieae*.

Stamens usually inserted at the base of the corolla tube; flowers often unisexual.....XIII. *Anthospermeae*.

Ovules lateral, attached to the septum of the cell.

Stipules neither foliaceous nor setiferous; trees or large shrubs; flowers confluent by the hypanthia to form a dense headXV. *Morindeae*.

Stipules either foliaceous or setiferous; herbs or very small shrubs; flowers never confluent by the hypanthia.

Stipules setiferous.....XVI. *Spermacoceae*.

Stipules foliaceous, similar to the leaves.....XVII. *Rubieae*.

I. CONDAMINEAE

Calyx lobes all similar*Portlandia*.

Calyx lobes dissimilar, one of them expanded into a large red blade*Pogonopus*.

II. OLDENLANDIEAE

Seeds angulate; plants (in Guatemalan species) annual*Oldenlandia*.

Seeds concavo-convex, not angulate; plants (in Guatemalan species) perennial.

Houstonia.

III. RONDELETIEAE

Corolla lobes imbricated in bud.

Plants herbaceous or nearly so, small and low; corolla almost rotate.

Pinarophyllon.

Plants tall shrubs or small trees, corolla with an elongate tube.

Seeds very large, usually 1 cm. long or more, horizontal.....*Sickingia*.

Seeds small or minute, winged or exalate.

Flowers very large, the tube of the corolla about 5 cm. long.....*Eizia*.

Flowers relatively small, the corolla tube seldom as much as 2 cm. long.

Rondeletia.

Corolla lobes contorted in bud.

Leaves finely lineolate between the veins; flowers very small*Deppea flava*.

Leaves not lineolate between the veins.

Tube of the corolla short, shorter than the lobes; corolla very small.

Corolla glabrous within, 4-parted.....*Deppea*.

Corolla villous within, 5-parted.....*Elaeagia*.

Tube of the corolla 2-several times as long as the lobes; corolla 5-16 cm. long.

Plants erect shrubs with leafy branches; corolla white*Lindenia*.

Plants acaulescent herbs, the flowers borne on naked scapes; corolla pink.

Steyermarkia.

IV. CINCHONEAE

- Plants twining, herbaceous *Manettia*.
 Plants erect, usually shrubs or trees.
 Calyx lobes dissimilar, one of them expanded into a large leaflike, white or cream-colored blade *Calycophyllum*.
 Calyx lobes all similar.
 Plants epiphytic; leaves fleshy when fresh, coriaceous when dry; flowers large, white.
 Seeds winged at either end *Cosmibuena*.
 Seeds with a tuft of hair at one end *Hillia*.
 Plants usually terrestrial; leaves herbaceous.
 Inflorescence spikelike, greatly elongate and densely many-flowered; trees. *Alseis*.
 Inflorescence never spikelike.
 Corolla lobes valvate in bud.
 Flowers 4-parted; capsule subglobose *Bouvardia*.
 Flowers 5-parted; capsule oblong to clavate *Cinchona*.
 Corolla lobes imbricate or contorted in bud.
 Anthers sessile *Blepharidium*.
 Anthers borne on evident, often elongate filaments.
 Stamens exserted *Exostema*.
 Stamens not exserted.
 Corolla symmetric; capsule not or scarcely compressed.
 Corolla funnelform without a narrow tube *Hintonia*.
 Corolla salverform, the tube narrow *Balmea*.
 Corolla conspicuously asymmetric; capsule strongly compressed. *Coutarea*.

V. NAUCLEEAE

- Ovules solitary in the cell; plants erect, unarmed *Cephalanthus*.
 Ovules numerous in the cell; plants scandent by recurved spines *Uncaria*.

VI. MUSSAENDEAE

- Leaf tissue finely lineolate between the veins.
 Calyx spatheaceous or lobate, the lobes not foliaceous; leaves very large and leathery *Pentagonia*.
 Calyx deeply lobate, the lobes foliaceous, green; leaves relatively small, membranaceous *Sommeria*.
 Leaf tissue not lineolate between the veins.
 Plants erect shrubs or small trees.
 Inflorescence a spikelike panicle; corolla white or pink *Gonzalagunia*.
 Inflorescence not a spikelike panicle.
 Inflorescence a terminal thyriform panicle; flowers orange-red *Isertia*.
 Inflorescence an axillary, subcapitate or short pedunculate cymose panicle hardly longer than the petioles *Sabicea*.
 Plants herbaceous or nearly so, sometimes scandent.
 Ovary 2-celled; plants herbaceous, prostrate *Coccocypselum*.
 Ovary 3-5-celled; plants herbaceous or suffrutescent, scandent *Sommeria*.

VII. GARDENIEAE

Plants armed with spines (in Guatemalan species).....*Randia*.
 Plants unarmed.

Inflorescence a many-flowered open thyriform panicle; seeds minute, foveolate.

Bertiera.

Inflorescence various but never paniculate, the flowers few or solitary; seeds large, the testa smooth or fibrous.

Corolla somewhat irregular, curved in bud, the tube greatly elongate, 12-16 cm. long.....*Posoqueria*.

Corolla regular or nearly so, the tube much shorter.

Flowers unisexual.

Stipules united to form a conic cap, this deciduous above a circular slit.

Pistillate flowers capitate or cymose.....*Amaioua*.

Pistillate flowers usually solitary.....*Duroia*.

Stipules not united to form a cap.....*Alibertia*.

Flowers perfect.

Corolla tube villous in both throat and base; ovary 2-celled; native trees.

Genipa.

Corolla tube villous in the throat or the base but not in both; ovary 1-celled; cultivated shrubs.....*Gardenia*.

VIII. HAMELIEAE

Ovary 4-5-celled.....*Hamelia*.

Ovary 2-celled.....*Hoffmannia*.

IX. GUETTARDEAE

Fruit separating at maturity into 2-cocci; calyx lobes 4-5, persistent; corolla lobes imbricate.....*Machaonia*.

Fruit drupaceous, not separating into cocci at maturity.

Corolla lobes valvate in bud or but obscurely imbricate.

Corolla lobes corniculate-appendaged outside near the apex; basal lobes of the anthers acute or attenuate.....*Chomelia*.

Corolla lobes not appendaged; basal lobes of the anthers obtuse.....*Anisomeris*.

Corolla lobes strongly imbricate in bud, 1 or 2 of them exterior.

Anthers long exserted; cymes paniculate; calyx persistent.....*Pittoniotis*.

Anthers included; inflorescence not cymose paniculate.

Calyx deciduous; plants usually abundantly pubescent.....*Guettarda*.

Calyx persistent upon the fruits; plants glabrous.....*Antirhea*.

X. CHIOCOCCEAE

Flowers 4-parted.

Inflorescence an axillary fascicle; plants abundantly pubescent.....*Asemnantha*.

Inflorescence a cymose-corymbose usually terminal panicle; plants sparsely pubescent.....*Allenanthus*.

Flowers 5-parted, usually in racemes, cymes or corymbs.

Corolla lobes imbricate in bud; fruit not compressed.....*Chione*.

Corolla lobes valvate in bud; fruit usually strongly compressed.....*Chiococca*.

XI. IXOREAE

- Bractlets connate and calyx-like; calyx usually truncate*Coffea*.
 Bractlets distinct, not calyx-like; calyx lobate*Ixora*.

XII. PSYCHOTRIEAE

- Plants prostrate and creeping, herbaceous; leaves cordate; flowers capitate ..*Geophila*.
 Plants never prostrate and creeping, usually woody; leaves rarely if ever cordate.
 Inflorescence an involucre, usually solitary head, or the heads sometimes branched, the outer bracts large and often brightly colored.....*Cephaelis*.
 Inflorescence not of involucre heads.
 Carpels of the fruit laterally compressed, the fruit didymous; low herbs.*Declieuxia*.
 Carpels of the fruit not laterally compressed, the fruit not didymous; trees or shrubs.
 Seeds with an incurved ventral surface; stipules pectinate-lobate or with setiform dorsal appendages*Rudgea*.
 Seeds not with an incurved ventral surface; stipules entire or bilobate, not appendaged.
 Corolla tube straight, not gibbous at the base; branches of the inflorescence usually green; corolla usually white, dull greenish yellow, or greenish.*Psychotria*.
 Corolla tube elongate, often more or less curved, gibbous at the base; branches of the inflorescence usually pale red or yellow; corolla often bright yellow or red.....*Palicourea*.

XIII. ANTHOSPERMEAE

- Stamens inserted in the throat of the corolla; style branches 4; fruits connate by pairs.....*Mitchella*.
 Stamens inserted at or near the base of the corolla tube; style branches 2; fruits distinct.....*Nertera*.

XIV. COUSSAREAE

- Seeds vertical; ovules connate, borne upon a common basal column*Coussarea*.
 Seeds horizontal; ovules separate in a 1-celled ovary, collateral, basal*Faramea*.

XV. MORINDEAE

- Flowers confluent in fruit to form a syncarp.....*Morinda*.
 Flowers distinct.....*Appunia*.

XVI. SPERMACOCEAE

- Fruit an indehiscent drupe; shrubs of the seashore*Ernodea*.
 Fruit dehiscent, separating into cocci or circumscissile.
 Fruit not separating into cocci, top of fruit circumscissile.....*Mitracarpus*.
 Fruit separating into cocci, these not circumscissile.
 Cocci 3-4.....*Richardia*.
 Cocci 2.

Cocci indehiscent.

Calyx lobate, the lobes elongate-subulate; cocci separating from a persistent axis.....*Crusea*

Calyx 2-10-dentate; fruit without a persistent axis.....*Diodia*.

Cocci, at least some of them, dehiscent.

Cocci opening only at the base; flowers axillary.....*Hemidiodia*.

Cocci opening at the apex; flowers axillary or in terminal heads.

Cells of the fruit alike, both opening; flowers axillary or in terminal heads.

Borreria

Cells of the fruit dissimilar, one opening, the other remaining closed; flowers all or chiefly axillary.....*Spermacece*.

XVII. RUBIEAE

Flowers each surrounded by a calyx-like involucre of leaflike bracts.....*Relbunium*.

Flowers not involucre.

Leaves opposite, broad, mostly deltoid-ovate.....*Didymaea*.

Leaves verticillate, linear to ovate.....*Galium*.

ALIBERTIA A. Richard

Unarmed shrubs or trees, usually glabrous or nearly so; leaves mostly coriaceous, sessile or petiolate; stipules interpetiolar, connate at the base, acute; flowers rather small, unisexual, terminal, sessile, the staminate fasciculate, the pistillate usually solitary; hypanthium hemispheric or globose, the calyx short or tubular, truncate or dentate; corolla coriaceous, salverform, the tube cylindric, sometimes contracted at the throat, the throat glabrous or villous, the limb 4-8-lobate, the lobes short or elongate, obtuse or acuminate, contorted; stamens 4-8, inserted in the corolla tube, the filaments short or none, the anthers linear, dorsifixed, included; ovary 2-8-celled, the style with 2-8 branches or with an elongate fusiform stigma; ovules few or numerous, pauciseriate or multiseriate, often immersed, the placentae affixed to the interior angle of the cell; fruit baccate, usually large, 2-8-celled, with thin septae, the placentae pulpy; seeds usually numerous, large, compressed, vertical, the testa coriaceous or fibrous.

Numerous species occur in South America, but only one other is known from North America, *A. garapatica* Schum., of Panama.

Alibertia edulis (L. Rich.) A. Rich. ex DC. Prodr. 4: 443. 1830.
Genipa edulis L. Rich. Act. Soc. Hist. Nat. Paris 1: 107. 1792.
Albondiga (Jutiapa); *guayaba de monte*; *guayabillo*; *guabillo*.
Figure 32.

Common in the *tierra caliente* of both slopes, ascending rarely to 1,500 m., usually at much lower elevations, in thickets or wet forest, often on rocky stream banks; Petén; Izabal; Chiquimula;

Jutiapa; Santa Rosa; Escuintla. Southern Mexico; British Honduras to Panama; ranging southward to the Amazon Basin.

Usually a shrub of 1-4 m. but sometimes as much as 7.5 m. tall and tree-like, almost glabrous throughout; stipules lance-triangular or deltoid, 8-18 mm. long, acute or attenuate-acuminate, striate; petioles 2-12 mm. long; leaf blades lance-oblong to ovate-oblong or oval-ovate, 6-20 cm. long, 2-7 cm. broad, usually short-acuminate, at the base acute to rounded, somewhat coriaceous, lustrous above, somewhat paler beneath and commonly short-barbate in the axils of the nerves; staminate inflorescence usually 6-8-flowered, the flowers white, fragrant, sessile; hypanthium turbinate, the calyx denticulate, glabrous or puberulent, the corolla 2.5 cm. long, minutely sericeous outside, the normally 5 lobes ovate or lance-oblong, acute or acuminate, sericeous within, half as long as the tube or longer; pistillate flowers solitary, sessile or subsessile, the ovary 4-celled, the calyx 4 mm. long, puberulent or glabrous, denticulate, the corolla 2-3 cm. long, the lobes about as long as the tube; fruit subglobose, about 2.5 cm. in diameter, green or yellowish, smooth; seeds suborbicular, brownish, 5 mm. broad, finely striate.

Called "torolillo" in El Salvador; "lirio" (Honduras); "wild guava" (British Honduras); "costarrica" (Tabasco).

Leaves of small seedling plants, often found abundantly in the forest, are narrower than those of adult plants and usually handsomely tinted with pink or purple. The fruit has been reported as edible, but it cannot be particularly palatable. Boys sometimes thrust a sharp stick through the fruits and use them as spinning tops, hence the name "trompillo" given to the shrub in Costa Rica.

ALLENANTHUS Standley

Small trees with terete branches, the internodes elongated; stipules persistent or deciduous, ovate, cuspidate. Leaves opposite, short petiolate, membranaceous; inflorescence a compound cymose-corymbose terminal panicle, or in axils of upper leaves; flowers small, pedicellate; hypanthium truncate, obovoid, laterally compressed and sometimes very narrowly winged; calyx 4-lobate, small, erect, persistent; corolla small, tubular-campanulate, 4-lobate; stamens 4, inserted in the throat of corolla, anthers ovate-oblong, nearly sessile; style bifid, as long as the corolla; ovary bilocular, each cell uniovulate; fruit dry, the locules parallel, central, surrounded by a spongy wing; seeds pendulous, compressed.

A small genus, of two known species, first discovered in 1939 in Panama. Since one species is known from Honduras and a variety of it from Chiapas, the genus is included from Guatemala where it may be expected.

Allenanthus hondurensis Standl. Ceiba 1: 45. 1950.

Moist valleys and hillsides in deciduous forests, about 800 m., Honduras.

Leaves ovate-oblong to lanceolate, long attenuate-acuminate, 11-14 cm. long and 5-6 cm. broad.

***Allenanthus hondurensis* var. *parvifolia* L. Wms.,**
Phytologia 25: 461. 1973.

Moist hillsides, alt. 800 m., Mexico (Chiapas).

Leaves lanceolate or ovate-lanceolate, acuminate, 3.5-5.5 cm. long and 1.5-2.5 cm. broad.

This Mexican variety has smaller leaves, and is smaller in most parts, except fruits.

ALSEIS Schott

Trees or large shrubs, more or less pubescent, with terete branches; leaves opposite, petiolate, membranaceous; stipules interpetiolar, short or elongate; inflorescence spicate or paniculate, the spikes simple or branched, axillary and terminal; flowers small, white or yellowish; hypanthium obconic, the calyx 5-lobate, the lobes broad or narrow, deciduous; corolla cylindric, short, pilose within, the limb 5-lobate, the lobes valvate; stamens 5, inserted at the base of the corolla tube; the filaments elongate, villous, the anthers versatile, oblong, exserted; ovary 2-celled, the style elongate, exserted, bipartite, the obtuse branches recurved; ovules numerous, imbricate, the placentae pendulous from the apex of the cell; capsule oblong-turbinate, 2-celled, septicidally bivalvate from the apex; seeds linear-fusiform, the testa produced at each end.

The genus is a small one, most of the species being South American. *A. blackiana* Hemsl. occurs in Panama.

Rachis of the inflorescence densely hirtellous; leaves hirtellous beneath, at least along the costa; capsules mostly more or less recurved at maturity.

A. yucatanensis.

Rachis of the inflorescence puberulent; leaves almost glabrous, puberulent beneath on the costa; capsules apparently erect or ascending at maturity..*A. hondurensis.*

***Alseis hondurensis* Standl. Trop. Woods 16: 48. 1928. *A. schippii* Lundell, Lloydia 4: 56. 1941 (type from Machaca, British Honduras, *Schipp 1230*). *Sapote de montaña*.**

Moist or wet, mixed forest, at or little above sea level; Petén; Izabal; Retalhuleu (?). British Honduras.

A tree about 10 m. high, the trunk 13 cm. in diameter, the stout branchlets subterete, minutely puberulent when young; stipules narrowly lanceolate, 1 cm. long; petioles 1.5-2 cm. long, the blades oblong-oblancoate or narrowly oblong-obovate, 10-20 cm. long, 3-7.5 cm. broad, abruptly acute or short-acuminate, gradually long-attenuate to the acute or acuminate base, glabrous above, minutely puberulent beneath on the nerves; flower spikes 11-20 cm. long, many-flowered, forming a terminal panicle, the flowers subsessile; hypanthium minutely puberulent, 2-2.5 mm.

long; calyx lobes ovate, 1 mm. long, obtuse, unequal, glabrous; capsules clavate, 1.5 cm. long or less.

The plant of *Retalhuleu* is represented only by sterile material and may belong to a distinct species.

Alseis yucatanensis Standl. Field Mus. Bot. 8: 50. 1930.
Dzon; son; palo son. Figure 13.

Chiefly in secondary forest, Petén (Chimah; Monte Polol).
British Honduras; Mexico (Yucatan; Tabasco).

A tree 20-30 m. tall, the trunk 40 cm. or more in diameter, the young branchlets hirtellous; stipules triangular, 5-9 mm. long, glabrous outside or nearly so, caducous; petioles 1-2.5 cm. long, the blades obovate or oblong-obovate, 10-30 cm. long, 4-12.5 cm. broad, acuminate or rounded and abruptly short-acuminate, cuneate-attenuate to the base, almost glabrous above, hirtellous beneath, especially on the costa, or finally glabrate; inflorescence spicate or paniculate, 7-40 cm. long; flowers sessile or nearly so; hypanthium hirtellous, 3 mm. long, the calyx lobes ovate, obtuse, almost 2 mm. long, puberulent; corolla broadly campanulate, 2.5 mm. long, puberulent outside; filaments long-exserted, villous below; capsules clavate, about 1.5 cm. long and 3 mm. thick, glabrate, brownish.

In British Honduras the tree is called "wild mamee"; from Yucatan the name "cacao-ché" is reported. In Tabasco it is said to be called "papelillo."

AMAIIOUA Aublet

Unarmed trees or shrubs, the branchlets usually sericeous; leaves opposite or ternate, short-petiolate; stipules interpetiolar, triangular or ovate, united at first into a conic cap, deciduous; inflorescence terminal cymes or fascicles; flowers white, unisexual; hypanthium oblong to hemispheric; calyx cupular or short-tubular, deciduous, truncate or 6-dentate, the teeth short, subulate; corolla salverform, sericeous outside, the tube terete or ventricose, the throat tomentose, the limb 6-lobate, the lobes contorted, oblong, spreading; stamens 6, inserted in the corolla tube, the filaments very short; anthers dorsifixed, linear, included; ovary 2-celled, the style short, the 2 branches coherent; ovules numerous, biseriate, the placenta affixed to the septum; fruit baccate, small, oblong, areolate at the apex, 1-celled, the cortex thin-coriaceous; seeds numerous, embedded in pulp, horizontal, compressed, suborbicular, the testa fibrous.

A small genus, chiefly South American; only one of the species extending into North America.

Amaioua corymbosa HBK. Nov. Gen. & Sp. Pl. 3: 419. 1820.
Figure 31.

Wet forest, Izabal, at or near sea level. Tabasco and British Honduras to Panama (Atlantic slope); Cuba; the Guianas.

A shrub or small tree 2-6 m. high, the trunk sometimes 15 cm. in diameter; stipules lance-oblong, 1.5-2.5 cm. long, ferruginous-sericeous outside; petioles 3-15 mm. long, the blades oval or oval-elliptic, 5-20 cm. long, 3-10 cm. broad, short-acuminate, at the base broadly rounded to short-acuminate, somewhat coriaceous, glabrous above, more or less sericeous beneath on the nerves and veins; staminate inflorescence corymbose, lax, often long-pedunculate, the calyx cupular, 3-4 mm. long, sericeous, denticulate, the corolla about 1.8 cm. long, the tube retrorse-sericeous, the lobes lanceolate, about equaling the tube; pistillate inflorescence capitate or corymbose, few-flowered, on a long or short peduncle, the corolla about 1 cm. long; fruit oval or obovoid, 12-15 mm. long, lustrous, brown-purple with pale yellow-green at the apex; seeds reddish brown, lustrous, striate, 3 mm. long.

Called "wild coffee" and "bastard coffee" in British Honduras. The bark is said to have the odor of pea pods. The name "tarro de venado" is reported from Tabasco.

ANISOMERIS Presl

Shrubs or small trees, rarely scandent, often with spinose branchlets; leaves sessile or petiolate, membranaceous or coriaceous; stipules interpetiolar, deciduous, acute or acuminate; flowers small, white or yellowish, usually in axillary pedunculate cymes, rarely solitary; hypanthium oblong or turbinate; calyx 4-lobate, the lobes commonly elongate, equal or unequal, persistent; corolla salverform or funnelform, with a slender, usually elongate tube, the throat glabrous or pilose, the limb 4-lobate, the lobes usually short, not appendaged, valvate or with slightly imbricate margins; stamens 4, inserted in the corolla throat; anthers linear-oblong or sagittate, dorsifixed, sessile, included or subexserted; ovary 2-celled, the style filiform, with 2 short branches; ovules solitary, pendulous from the apex of the cell; fruit drupaceous, small, oblong or ovoid, osseous, 2-celled; seeds pendulous, cylindric.

The majority of the species are South American. About five are known from Central America, and two more from Mexico.

Corolla tube glabrous outside; calyx lobes minute, as broad as long.....*A. brachypoda*.

Corolla tube pilose outside.

Flowers in pedunculate cymes; calyx lobes minute, as broad as long.....*A. protracta*.

Flowers sessile at or near the ends of the branches; calyx lobes oblong-linear.

A. recordii.

Anisomeris brachypoda (Donn.-Sm.) Standl. Field Mus. Bot. 4: 293. 1929. *Chomelia brachypoda* Donn.-Sm. Bot. Gaz. 47: 255. 1909. Figure 40.

Wet forest along streams or in quebradas, 900-1,600 m.; Alta Verapaz (type from banks of Río Ogewaj near Sasís, *Tuerckheim II*. 2253); Chimaltenango; Huehuetenango; sterile specimens from Quezaltenango and San Marcos may represent the same species.

An unarmed shrub or small tree, sometimes 12 m. high, with slender branches; stipules narrowly triangular, 6-8 mm. long, subulate-attenuate, sericeous outside; petioles 3-6 mm. long; leaf blades lance-oblong or elliptic-lanceolate, 6-10 cm. long, 1.5-3.5 cm. broad, long-acuminate, acute or short-acuminate at the base, glabrous above or nearly so, appressed-pilose beneath along the nerves and barbate in the nerve axils; cymes axillary, 4-8-flowered, on peduncles 5-8 mm. long, the flowers sessile; calyx and hypanthium 2.5-3 mm. long, minutely strigillose, the lobes minute, triangular; corolla dull dark red, the tube 11-12 mm. long, glabrous outside, the oval lobes 2 mm. long, sparsely strigillose outside.

An inconspicuous shrub, in appearance suggestive of some species of *Rondeletia*.

Anisomeris protracta (Bartl.) Standl. Field Mus. Bot. 4: 293. 1929. *Guettarda protracta* Bartl. ex DC. Prodr. 4: 457. 1830. *Chomelia protracta* Standl. Contr. U. S. Nat. Herb. 23: 1384. 1926. *Cheché*m (Cobán).

Common in wet, pine or mixed, limestone forest, or on open limestone slopes, 1,500 m. or lower; Alta Verapaz; Izabal; Chiquimula; Huehuetenango. Southern and western Mexico; British Honduras; Honduras.

A shrub or small tree, commonly 3-6 m. high but said to attain sometimes a height of 10 m.; branches densely sericeous; stipules 5-9 mm. long, triangular-lanceolate, long-attenuate, sericeous outside, brown; leaves short-petiolate, narrowly lanceolate to oblong-elliptic, 7-15 cm. long, 2.5-5.5 cm. broad, long-acuminate, with a narrow, often falcate tip, attenuate to subobtusate at the base, green above and appressed-pilose or glabrate, paler beneath and sericeous, especially along the nerves, barbate in the nerve axils; cymes pedunculate, 1-2.5 cm. long, sericeous, the flowers sessile, secund; calyx and hypanthium 1.5-2.2 mm. long, the hypanthium densely short-pilose the calyx lobes minute, rounded; corolla white, densely sericeous outside, the tube 7-10 mm. long, the lobes rounded, about 1.5 mm. long; fruit dark blue at maturity, oval, 4-5 mm. long, thinly sericeous.

In Tabasco and British Honduras the species is reported as growing in savanna forest and doubtless it occurs in similar locations in Petén.

Anisomeris recordii Standl. N. Am. Fl. 32: 227. 1934. *Chomelia recordii* Standl. Trop. Woods 7: 9. 1926 (high forest between Los Andes and Entre Ríos, Izabal, *Record G31*). *Clavo*. Collected also on southern slopes of Cerro San Gil, Izabal, at 30-500 m. Nicaragua and Panama.

A shrub or small tree, about 5 m. high, the trunk somewhat fluted, the branchlets hirtellous or glabrate; stipules 2.5-5 mm. long, triangular or ovate, acuminate or cuspidate, appressed-pilose; petioles 2-3 mm. long; leaf blades broadly ovate or ovate-elliptic, 4-8.5 cm. long, 2-5 cm. broad, obtuse to abruptly acute, with

obtuse tip, rounded or obtuse at the base, green above and almost glabrous, copiously short-pilose beneath with spreading or subappressed hairs; flowers clustered and sessile at the ends of the branches; calyx and hypanthium 5-6 mm. long, densely pilose with long appressed white hairs; calyx lobes oblong-linear, equaling the hypanthium, corolla white, densely white-sericeous, the very slender tube 2 cm. long, the lobes oblong, obtuse, 4 mm. long, glabrous within; fruit green, turning dull reddish, oval, 7-8 mm. long.

ANTIRHEA Commerson

Trees or shrubs, usually glabrous and resinous-viscid; leaves opposite, mostly coriaceous and lustrous; stipules deciduous or persistent; flowers small, perfect or polygamous, sessile or short-pedicellate, secund along the branches of a bifid, scorpioid, axillary, pedunculate or sessile cyme; hypanthium ovoid or obovoid; calyx lobes persistent, often unequal; corolla funnelform, glabrous or sericeous, the tube elongate, cylindric, the throat naked or pilose, the limb 4-5-lobate, the lobes obtuse, imbricate, 2 of them exterior; stamens 4 or 5, inserted in the corolla throat, included or subexserted, the filaments short; anthers oblong, dorsifixed; ovary with 2-10 or sometimes more numerous cells, the style filiform, the stigma capitate or 2-3-fid; ovules solitary, pendulous; fruit drupaceous, small, oblong, with thin flesh, the stone ligneous or osseous; seeds cylindric.

About 40 species, chiefly West Indian, but occurring also in Asia and the islands of the Indian Ocean. One other species is known from Central America, *A. panamensis* Standl., endemic in Panama.

Antirhea lucida (Swartz) Benth. & Hook. Gen. Pl. 2: 100. 1873. *Laugeria lucida* Swartz, Prodr. 48. 1788. Figure 38.

Known in this region only from the Jacinto Hills of British Honduras, at 60 m. (*Schipp S616*); and at Tikal, Petén (*Tún 1000*). Bahamas, through the Greater Antilles to Trinidad.

A shrub or tree, reported to attain in British Honduras a height of 18 m. with trunk diameter of 60 cm., the bark smooth; stipules ovate-deltoid, 5-8 mm. long, acuminate, minutely sericeous outside, caducous; petioles 3-8 mm. long, the blades elliptic to elliptic-oblong, obtuse or acutish, acute to rounded and short-decurrent at the base; cymes usually once bifid, the slender branches 3-8 cm. long, the peduncle 2-3 cm. long, the numerous flowers distant, sessile or nearly so; calyx and hypanthium 2-3 mm. long, glabrous or minutely puberulent; calyx 5-lobate, the lobes semiorbicular, ciliolate; corolla white, 5-7 mm. long, the obtuse lobes half as long as the tube; fruit oval or oblong, red or black, 5-7 mm. long.

The single British Honduras specimen is in fruit, and flowering material may show that it represents a distinct species, although this is rather improbable.

APPUNIA Hooker f.

Shrubs, glabrous or puberulent, with terete branches; leaves opposite, short-petiolate, membranaceous, acuminate; stipules interpetiolar, broadly triangular or annular, connate with the petiole, persistent; flowers small, white, capitate, the heads long-pedunculate, few-flowered, axillary, bracteate at the base; hypanthium turbinate or hemispheric, the calyx cupular, truncate, obscurely 5-dentate; corolla tube cylindric, puberulent or glabrous in the throat, the limb 5-lobate, the lobes valvate, linear-oblong, about equaling the tube; stamens 5, inserted in the corolla tube, the filaments very short; anthers dorsifixed, included; ovary perfectly or imperfectly 4-celled, the style filiform, the stigma capitate; ovules solitary, peltately attached to the middle of the septum; fruit baccate, subglobose, containing four 2-celled nutlets, one of the cells empty, the other 1-seeded.

The genus is a small one, one species being found in Panama, the others distributed in the Guianas.

Appunia guatemalensis Donn.-Sm. Bot. Gaz. 48: 294. 1909.
Morinda mesochora Standl. Field Mus. Bot. 4: 345. 1929 (type from Honey Camp, British Honduras, *Lundell* 19). Figure 57.

Wet mixed forest, sometimes in thickets or hillside pine forest, at or little above sea level; Izabal (type from Livingston, *Tuerckheim* II.1230). British Honduras; Atlantic coast of Honduras and Nicaragua.

A glabrous shrub 1-2.5 m. tall; stipules apiculate or forming a short bicuspidate sheath; leaves short-petiolate or almost sessile, elliptic-oblong or obovate-oblong, 10-16 cm. long, 5-7 cm. broad, acuminate or abruptly acuminate, acute or acuminate at the base, with 5-6 pairs of lateral nerves; peduncles axillary, as much as 4 cm. long but usually shorter, the heads about 7-flowered, without the corollas 5-6 mm. in diameter; corolla white, often tinged with purplish outside, 1.5 cm. long; fruit globose, about 6 mm. in diameter, becoming dark purple.

ASEMNANTHA Hooker f.

Slender pubescent shrubs with terete branches; leaves opposite, short-petiolate, subcoriaceous; stipules interpetiolar, small, persistent; flowers small, in few-flowered axillary fascicles, yellow, short-pedicellate; hypanthium ovoid; calyx 4-lobate, the lobes elongate, persistent; corolla urceolate-tubular, puberulent outside, the throat slightly contracted, the limb 4-lobate, the lobes small, erect-patent, obtuse, valvate in the bud; stamens 4, the filaments joined at the base and attached to the disk, *not* to the corolla, free above, pilose; anthers linear-oblong, basifixed, included; ovary 2-celled, the style filiform, the stigma obtuse, exserted; ovules solitary, pendulous from the apex of the cell; fruit drupaceous, suborbicular, laterally compressed, chartaceous when dry; seeds laterally compressed.

The genus consists of a single species.

Asemnantha pubescens Hook. f. in Bentham & Hooker, Gen. Pl. 2: 107. 1873; in Hook. Icon. 12: 40, *t.* 1145. 1873. Figure 43.

Collected at Honey Camp, British Honduras. Petén. Mexico (Yucatan), whence originally described.

A slender shrub, commonly about 1 m. high, the branchlets hirtellous; stipules 3-5 mm. long, subulate-acuminate from a broad base; petioles 2-4 mm. long, the blades lanceolate to broadly ovate or elliptic, 3-7 cm. long, 1-2.5 cm. broad, gradually narrowed to the acute or attenuate apex, rounded to acute at the base, short-pilose on both surfaces, at least when young; flowers few in each fascicle, the pedicels very short; calyx and hypanthium short-pilose, the calyx lobes lance-linear, attenuate, 4 mm. long, spreading in fruit; corolla half longer than the calyx lobes, short-pilose, the lobes rounded-deltoid, acutish, about one-sixth as long as the tube; fruit short-pilose, 4-4.5 mm. long.

BALMEA Martínez

Shrubs, terrestrial or sometimes epiphytic, with thick branches; stipules interpetiolar, ovate-acuminate, caducous; leaves opposite, large and broad, petiolate, membranaceous, deciduous, mostly shallowly cordate at the base; inflorescence terminal, cymose-corymbose, pedunculate, the peduncle recurved and the flowers thus pendulous, the flowers few or rather numerous, mostly ternate, slender-pedicellate; hypanthium narrowly turbinate; calyx 5-parted, the segments linear, more or less persistent; corolla tube cylindric or slightly dilated upward, the lobes broad, contorted, reflexed in anthesis; stamens inserted on the upper part of the corolla tube, the filaments complanate, the anthers dorsifixed; fruit capsular, erect, oval-oblong, 2-celled, septicidally bivalvate at the apex; seeds numerous, imbricate, broadly winged.

The genus consists of a single species. It was named for Professor Juan Balme of Mexico.

Balmea stormae Martínez, Bull. Torr. Bot. Club 69: 438, *f.* 1-11. 1942; Anal. Inst. Biol. Méx. 13: 37, *f.* 1-4. 1942.

Moist or wet, mixed or oak mountain forest, 1,400-2,300 m.; Zacapa (Sierra de las Minas); Jalapa (Potrero Carrillo); Huehuetenango (northwest of Cuilco). Mexico (Michoacán).

A glabrous shrub or tree, sometimes 7 m. high, terrestrial or sometimes epiphytic (on *Quercus*), rather sparsely branched, sometimes from the base, the trunk as much as 20 cm. in diameter; bark smooth, greenish purple, peeling off in thin shreds; wood hard, whitish; internodes very short, the leaf scars conspicuous; leaves often clustered at the ends of the branches, on long slender petioles, broadly ovate or rounded-ovate, mostly 9-13 cm. long and 6-11 cm. broad, acute or abruptly short-acuminate, usually cordate or subcordate at the base; stipules about 1 cm. long; corymbs generally 9-13-flowered, borne on peduncles 5 cm. long or shorter, the pedicels 2 cm. long or less; flowers sweet-scented, bright red tinged with purple, or when fully open dark purple; calyx lobes 8-10 mm. long; corolla tube 22-28 mm. long, the 5 lobes subovate, short;

anthers fusiform, 9-10 mm. long, not exserted, the filaments only 4 mm. long; style 20-23 mm. long, the stigma bilamellate; capsule 23-28 mm. long; seeds, including the wing, 3.5-4 mm. long.

In Michoacán the tree is known by the vernacular name "ayuque." The senior author first became acquainted with this tree in 1941, when a collection of it was made near Uruapam, Michoacán by William C. Leavenworth and H. Hoogstraal. It was recognized that it was something new to the Mexican flora, but study and description of the plant was delayed because the material was incomplete. Not long afterward complete material from the same state was forwarded by Professor Martínez, who had made a detailed study of it, prepared a full description, and had made several handsome drawings showing all the details. He believed the plant represented a new genus, a belief that was fully justified. In December, 1939, Dr. Steyermark obtained in the Department of Jalapa sterile material of a Rubiaceae plant that could not be determined, until finally it was associated with the Mexican *Balmea*. Two other sterile collections were made by him in Zacapa and Huehuetenango in 1942. It thus happens that a tree growing at or near a locality which various botanists have worked (Uruapam) was overlooked until quite recently, when it has been found in no less than five widely separated localities. Since the Guatemalan collections are sterile, there is a possibility that they represent a distinct species, but the foliage, which is rather distinctive, is exactly like that of the Mexican plant.

BERTIERA Aublet

Shrubs or small trees, glabrous or pubescent, with terete branchlets; leaves opposite, petiolate or sessile; stipules intrapetiolar, connate into a bifid sheath; inflorescence terminal, cymose, the cymes arranged in terminal pedunculate panicles; flowers small, white or greenish; hypanthium globose or turbinate, the calyx 5-dentate or truncate, persistent; corolla funnelform, the tube terete, usually sericeous outside, the throat glabrous or villous, the limb 5-lobate, the lobes short, ovate, acute, contorted in bud; stamens 5, inserted in the corolla throat; filaments very short, the anthers dorsifixed, included; ovary 2-celled, the style filiform, glabrous, the stigma fusiform, entire or bilobate; ovules numerous, the placentae affixed to the septum; fruit baccate, globose, fleshy, 2-celled; seeds numerous, very small, angulate, foveolate or granulate.

A small genus of tropical North and South America. Two other North American species are known, in Costa Rica and Panama.

Bertiera guianensis Aubl. Pl. Guin. 180, t. 69. 1775. *B. tenuis* Lundell, Wrightia 4: 49. 1968 (type, from Alta Verapaz, Contreras 4318). Figure 33.

Wet forests and thickets, near or little above sea level; Alta Verapaz; Izabal. Southern Mexico; British Honduras; Costa Rica and Panama south to Bolivia and Brazil; West Indies.

A slender shrub or small tree 2-4 m. high, the trunk sometimes 8 cm. in diameter, the branchlets appressed-pilose or glabrate; stipules 5-10 mm. long, the lobes subulate-acuminate, brown, sericeous; petioles 3-7 mm. long, the blades lance-oblong or ovate-oblong, membranaceous, 6-17 cm. long, 2-7 cm. broad, short-acuminate or attenuate, acute or acutish at the base, glabrous above or nearly so, appressed-pilose beneath, especially along the veins; panicle narrow and elongate, the flowers sessile, second, the bracts linear; calyx and hypanthium 1.5-2.5 mm. long, short-pilose, the calyx lobes triangular; corolla greenish white, 4.5-7 mm. long, appressed-pilose, the lobes deltoid-ovate, acuminate, half as long as the tube; fruit globose, 3.5-4 mm. in diameter, blue, 10-costate; seeds 1-2 mm. long, coarsely granulate, orange-brown.

We assume that this lowland species may be found on the Atlantic side of Honduras and Nicaragua, but we have seen no specimens.

BLEPHARIDIUM Standley

Shrubs or small trees, pubescent or almost glabrous, with subterete branchlets; leaves opposite, petiolate, large; stipules intrapetiolar, large, thin, acuminate, caducous; flowers large, pedicellate, bibracteolate, in 3-flowered axillary long-pedunculate cymes; hypanthium obovoid, the large calyx 4-lobate, the very broad lobes imbricate, ciliolate; corolla salverform, coriaceous, the slender tube elongate, densely villous within except near the base, the 4 lobes imbricate in bud, broad, spreading, one of them exterior; stamens 4, inserted in the corolla throat, the anthers sessile, linear, dorsifixed, included; ovary 2-celled, the style filiform, the stigma bilobate, with linear elongate lobes; ovules numerous, imbricate, winged, the placentae attached to the septum; capsule large, somewhat ligneous, 2-celled, loculicidally bivalvate; seeds broadly winged.

One other species is known, *B. mexicanum* Standl., described from Palenque, Chiapas (Mexico).

Blepharidium guatemalense Standl. Journ. Wash. Acad. Sci. 8: 59. 1918. *Popiste; palo de estricnina; irayol blanco; irayol*.

Usually in hilly pine forest, sometimes in savannas, 300 m. or lower; endemic; Petén; Alta Verapaz (type from forest along Río Saclac below Secanquím, *Pittier* 266); Izabal (Quiriquá; Cristina; Santa Cruz); Huehuetenango (Ixcán).

A shrub or small tree, usually 1.5-5.5 m. tall, sometimes a tree of 6-18 m., the branchlets glabrous; stipules ovate-triangular, 2-2.5 cm. long, acuminate, brown, glabrous outside, sericeous within at the base; petioles stout, 2.5-5 cm. long, glabrous; leaf blades oval-oblong to oblanceolate or oblong-obovate, 15-35 cm. long, 4-21 cm. broad, obtuse to acute or abruptly short-acuminate, obtuse to attenuate at the base, glabrous above, sparsely short-pilose beneath along the costa, short-barbate in the

nerve axils; peduncles 6-20 cm. long, glabrous, the stout pedicels 2 cm. long or less; bractlets broadly ovate, 3-4 mm. long, deciduous; calyx glabrous, 4-5 mm. long, 7-8 mm. broad, half as long as the hypanthium, the broad lobes rounded or truncate; corolla tube about 6 cm. long, 4-5 mm. thick, glabrous outside, the oval lobes 1 cm. long; capsule oblong-oval, 1.5-3 cm. long, obtuse at the base and apex.

The shrub is plentiful on the brushy pine hillsides above Quiriaguá Hospital. It is probable that *B. mexicanum* also is to be found in northern Petén. It differs in having smaller flowers, the corolla tube only 4 cm. long, and sparse pubescence over the lower leaf surface. The wood is used for rafters, beams, and supports of lowland houses. In Huehuetenango the leaves and bark are reputed poisonous, hence the name "estricnina" given the tree, but it is improbable that poisonous properties are found in this genus.

BORRERIA G. F. W. Meyer

Annual or perennial herbs, sometimes woody at the base or almost throughout, the stems more or less tetragonous; stipules united with the petioles to form a sheath, this bearing few or numerous setae; leaves small and usually narrow, opposite or appearing whorled, often with fascicles of smaller leaves in their axils; flowers small, in sessile or terminal heads, the terminal heads subtended by leaflike bracts; hypanthium turbinate or cylindric, the calyx 2-or 4-dentate, the lobes usually narrow, sometimes with small interposed teeth; corolla funnelform, the 4 lobes valvate in bud; stamens 4, inserted in or below the mouth of the corolla tube, the anthers often exserted; ovary 2-celled, the style simple, the stigma shallowly bilobate; ovules solitary in the cell, affixed to the septum; capsule coriaceous or membranaceous, crowned by the persistent calyx, septicidally dehiscent or rarely both septicidal and loculicidal, the valves coherent at the base; seeds minute, oblong, convex dorsally, sulcate ventrally.

Perhaps as many as 100 species, pantropical in distribution but chiefly in South America. A few others are found in Central America. The species found in Guatemala are inclined to be weedy and their altitudinal range is often greater than might be expected. It is sometimes difficult to distinguish Borrerias from other genera of the tribe Spermacoceae, unless fruits are present.

Seeds transversely striate; plants annual; calyx 4-lobate.

Flower heads 2-3 cm. broad; sepals oval, rounded at the apex *B. vegeta*.

Flower heads less than 1.5 cm. broad; sepals triangular-subulate *B. laevis*.

Seeds not transversely striate, either smooth or reticulate; calyx 2- or 4-lobate.

Leaves linear or nearly so, usually verticillate; plants perennial.

Sepals 4; plant *usually* pubescent *B. suaveolens*.

Sepals 2; plant *usually* glabrous *B. verticillata*.

Leaves mostly elliptic or broader; plants annual.

Sepals 4, fruits pubescent.

Plants usually prostrate, yellowish when dry; flower heads axillary.

B. latifolia.

Plants usually erect, not yellowish when dry; flowers heads terminal and axillary.....*B. ocymoides*.
 Sepals 2; fruits white-villous above the middle.....*B. densiflora*.

Borreria densiflora DC. Prodr. 4: 542. 1830. *Spermacoce spinosa* Swartz, Obs. Bot. 45. 1791, not Jacq., 1760, nor L., 1762. *B. spinosa* Cham. & Schlecht. Linnaea 3: 340. 1828, excluding Linnean synonym. *B. radicata* Brandegee, Univ. Calif. Publ. Bot. 10: 416. 1924 (type from Jalisco, Mexico).

A weedy plant, in thickets, on brushy hillsides, or on sandbars along streams, chiefly in the east at 500 m. or less, but in Huehuetenango ascending to 1,700 m.; Zacapa; Santa Rosa; Escuintla; Huehuetenango. Southern Mexico; El Salvador; Honduras; Costa Rica and Panama; southward to Argentina; West Indies.

Plants annual, usually erect or nearly so and stout, often simple at the base, almost glabrous but the stems usually sparsely scabrous on the angles; leaves linear or linear-lanceolate, as much as 8 cm. long and 12 mm. broad but usually smaller, grayish green when dried, acuminate, narrowed to the base, the lateral nerves usually obvious; stipule sheath with numerous long setae; flower heads subtended by 4-8 large leaflike bracts, 1.5-2 cm. broad; the flowers very numerous and densely congested; hypanthium densely white-pilose above; calyx lobes 2 and 1.5-2 mm. long, linear; corolla white, slightly exceeding the calyx, glabrous; stamens equaling the corolla lobes; capsule oblong, white-villous above the middle, 3-4 mm. long; seeds brown-red, finely pitted.

Inclined to be weedy as are others of the genus.

Borreria laevis (Lam.) Griseb. Fl. Brit. W. Ind. 349. 1861. *Spermacoce laevis* Lam. Tabl. Encycl. 1: 273. 1791. *S. echioides* HBK. Nov. Gen. & Sp. 3: 269. 1820. *Golondrina* (Guatemala); *sanalotodo*; *hierba de pájaro*; *ritpur* (Alta Verapaz, fide Dieseldorff); *palis* (Petén, fide Lundell); *zic-chichibe* (Petén, Maya, fide Lundell). Figure 64.

A common weed throughout the greater part of Guatemala, except at high elevations, usually in thickets, on gravel bars, or in waste or cultivated ground, commonest at low elevations but ascending to 2,000 m. or probably even higher; Petén; Izabal; Alta Verapaz; El Progreso; Zacapa; Chiquimula; Jalapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Suchitepéquez; Retalhuleu; Quezaltenango; San Marcos; Huehuetenango; Quiché. Mexico to Panama; southward through the greater part of South America; West Indies.

Plants annual, erect or more often decumbent or procumbent, the stems glabrous or sparsely pubescent; leaves lanceolate to ovate-lanceolate, ovate, or oblong-lanceolate, commonly 2-5 cm. long and 1-2.5 cm. broad, acuminate, cuneate and usually short-petiolate at the base, glabrous or beneath usually pubescent; stipule sheath bearing numerous setae of about the same length; flower heads terminal and axillary, up to about 1.5 cm. broad, usually smaller; hypanthium obovoid, pubescent above; calyx teeth 4-5, small, triangular-subulate; corolla white, the lobes about equaling the tube, pubescent; capsule ellipsoid, 2-3 mm. long, somewhat flattened laterally, pubescent above; seeds castaneous, transversely striate.

One of the commonest weeds of Central America, often abundant in banana and coffee plantations, and grain fields. According to Dieseldorff, in his "Las plantas medicinales del departamento de Alta Verapaz," (1940), it is used in that department in native medicine.

Borreria latifolia (Aubl.) Schum. in Mart. Fl. Bras. 6(6): 61, *t.* 80. 1888. *Spermacoce latifolia* Aubl. Pl. Guian. 55, *t.* 19, *f.* 1. 1775.

Damp thickets or fields, sometimes on grassy banks or even in pine forest, at low elevations, ascending to about 1,000 m.; probably in Petén and Izabal; Alta Verapaz; Baja Verapaz; Jutiapa; Chiquimula; Santa Rosa; Escuintla; Suchitepéquez; San Marcos; Retalhuleu. Southern Mexico; British Honduras to Panama, southward through the warmer parts of South America; West Indies.

Plants annual, usually prostrate or procumbent and often with elongate stems, sometimes erect or nearly so, the whole plant yellowish in the dry state; stems acutely quadrangular or even narrowly winged, glabrous or villosulous; leaves almost sessile, chiefly elliptic, sometimes slightly obovate, about 2-4 cm. long and 1-1.8 cm. broad, acute, pilose or villosulous on both surfaces, the lateral nerves conspicuous; stipule sheath about 1 mm. long, the setae 3.5 mm. long, pilose; flower heads dense and rather few-flowered, mostly axillary and about 1 cm. in diameter; sepals 4, narrowly triangular, 1.5 mm. long, acute, ciliate; corolla white or pale bluish, 3 mm. long, pilose at the apex; style bilobate, with recurved lobes; capsule 3.5 mm. long, subglobose, densely pilose above; the seed light brown, 2.5-3 mm. long, only obscurely reticulate.

Among Central American species, this may be recognized readily by the evident yellowish coloring of the dried plant and by the relatively large almost smooth seeds. This species is often weedy and as more and more forest areas are put into agriculture it may be expected as an invader. The resemblance to *Mitracarpus hirtus* is rather great.

Borreria ocymoides (Burm.) DC. Prodr. 4: 544. 1830. *Spermacoce ocymoides* Burm. f. Fl. Ind. 34, *t.* 13, *f.* 1. 1768. *S. parviflora* G. F. W. Meyer, Prim. Fl. Esseq. 83, *t.* 1. 1818. *B. tampicana* DC. Prodr. 4: 544. 1830, in part. *S. pringlei* Wats. Proc.

Am. Acad. 25: 152. 1890. *Golondrina blanca* (Chimaltenango); *palitaria* (Petén); *catalpín* (Alta Verapaz, fide Dieseldorff).

Widely distributed as a weed in thickets, pine and oak forest, pastures, cafetales, cultivated fields, arenales, and other habitats, chiefly in the lowlands but ascending in the interior to about 2,000 m.; Petén; Alta Verapaz; Izabal; Zacapa; Chiquimula; Jalapa; Guatemala; Sacatepéquez; Chimaltenango; Suchitepéquez; Retalhuleu; San Marcos; Huehuetenango. Mexico; British Honduras to Panama, and through the greater part of South America; West Indies; naturalized in Asia and Malaysia.

Plants annual, usually erect, sometimes spreading, 50 cm. high or less, the stems acutely quadrangular, glabrous or sometimes scabrous or hispidulous on the angles; stipule sheath 2.5 mm. long, the setae as long or slightly longer; leaves small, subsessile, elliptic to ovate or lance-elliptic, mostly 1.5-2 cm. long, sometimes longer, 5-10 mm. broad, scaberulous above, especially near the margins, scaberulous beneath on the nerves, these usually 4 on each side and rather conspicuous; flower heads terminal and axillary, small, the crowded flowers short-pedicellate; hypanthium turbinate, glabrous or sometimes puberulent above; calyx lobes usually 4, divided 3 and 1, linear, acute, 1 mm. long or less; corolla white, hardly 1 mm. long, minutely puberulent outside, villous within, the lobes slightly longer than the tube; anthers sessile, not exerted; capsule 1 mm. long, crowned by the slightly enlarged sepals; seeds dark brown, reticulate, about 1-1.5 mm. long.

In the Cobán region this species often is found in marshes. According to Dieseldorff, in his "Las plantas medicinales del departamento de Alta Verapaz," (1940), it is used in that department in native medicine.

The fruit is nearly or completely glabrous, when it dehisces usually three calyx lobes are on one part and only one on the other.

Borreria suaveolens G. F. W. Meyer, Prim. Fl. Esseq. 81, t. 1. 1818. *Spermacoce tenella* HBK. Nov. Gen. & Sp. 3: 345. 1820. *B. tenella* Cham. & Schlecht. Linnaea 3: 317. 1828. *B. haenkeana* DC. Prodr. 4: 547. 1830. *Hierba de toro*; *lengua de pájaro*.

Pine forest or savannas, sometimes in mountain meadows or thickets, except in Petén usually growing at 900-2,000 m.; Petén; Zacapa; Jutiapa; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango; Quiché; Huehuetenango. Mexico to Panama, and widely distributed through South America.

Usually a stiff erect perennial, often much branched from the base, 50 cm. high or less, sometimes suffrutescent, very variable in foliage, at least in South America, less variable in Central America, the stems pubescent or glabrous; stipule sheath short, with few or numerous long setae; leaves mostly linear or lance-linear and 2-5 cm. long, 1-nerved, rather stiff, often revolute, scabrous on both surfaces or glabrous;

flower heads very dense and many-flowered, 1 cm. broad or slightly larger, often all terminal but heads frequently present in some of the upper leaf axils, the terminal heads subtended by large leaflike bracts; hypanthium villous; sepals longer than the hypanthium, linear, ciliate; corolla white, 2.5-3 mm. long; stamens exserted; capsule oblong, pubescent at least at the apex, 2 mm. long; seeds brown, almost smooth.

South American material usually referred to this species is exceedingly variable, the extremes appearing to represent quite distinct species. Attempts to subdivide the species have not been successful heretofore, but it is quite possible that at some time in the future other workers may be more successful. The Central American collections exhibit relatively little variation except in quantity of pubescence.

Borreria vegeta Standl. & Steyerl. Field Mus. Bot. 23: 21. 1943.

Weedy fields, damp thickets, or open slopes, 150-900 m.; Jutiapa and Santa Rosa; type collected between Jutiapa and La Burrera, northeast of Jutiapa, *Standley 76007*. El Salvador; Honduras.

A stout erect annual, simple or with a few branches, the stems subterete below, tetragonous above, laxly whitish-pilous; stipule sheath 5 mm. long, bearing several setae of equal length; leaves large, sometimes contracted into a broad petiole as much as 1 cm. long, lance-oblong to ovate or oblong-elliptic, 3.5-7.5 cm. long, 1.2-2.8 cm. broad, attenuate-acuminate, cuneately contracted at the base, green above and sparsely scabrous or glabrate, rough to the touch, paler beneath, scabrous or hispidulous on the nerves and costa, the lateral nerves 6-7 pairs; heads large, chiefly terminal but often also in the uppermost leaf axils, 2-2.5 cm. broad, the terminal rounded-obovate, about 1.5 mm. long, green, rounded at the apex, pectinate-ciliate; corolla white, 2.5 mm. long, glabrous outside, the lobes ovate, subacute; anthers exserted; capsule oval or broadly oblong, 3 mm. long, membranaceous, villous above or glabrate; seeds terete, fuscous-ferruginous, 2 mm. long, transversely rugose.

Borreria verticillata (L.) G. F. W. Meyer, Prim. Fl. Esseq. 83. 1818. *Spermacoce verticillata* L. Sp. Pl. 102. 1753. *B. podocephala* DC. Prodr. 4: 541. 1840. *Sanalotodo* (Huehuetenango); *hierba de pájaro* (fide Aguilar).

A widely distributed and in many localities a common weedy plant, usually at low elevations but ascending to about 2,000 m., in thickets or savannas, meadows, or in waste or cultivated ground; Petén; Alta Verapaz; Izabal; Jalapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Quiché; Suchitepéquez; Retalhuleu; Huehuetenango. Mexico; British Honduras to Panama; southward through most of South America; West Indies.

Plants perennial, glabrous or nearly so, usually erect and simple or sparsely branched, often copiously branched from the base, usually 40 cm. high or less, the stems tetraginous; stipule sheath very short, the setae about 1.5 mm. long; leaves sessile or nearly so, linear or lance-linear, mostly 1.5-4 cm. long and 1.5-6 mm. broad, commonly 1-nerved, often with fascicles of smaller leaves in the axils; flower heads chiefly terminal but sometimes arising also from the upper leaf axils, the terminal heads subtended by 2 or 4 leaflike bracts; hypanthium pilose above, the 2 sepals narrowly triangular, 1.5 mm. long or less; corolla white, 3 mm. long, hispidulous outside at the apex, the lobes about equaling the tube; anthers exserted; capsule 2.5 mm. long; seeds brown.

The maya names used in Yucatan are "sac-muy" and "nizots"; "manzanilla de campo" (Yucatan). A century ago the plant was collected near Acatenango by Hartweg, and reported as in use there as a remedy for syphilis.

The species resembles *B. suaveolens* very much but has only two sepals, the flower heads are smaller and the plant is usually glabrous or glabrate.

BOUVARDIA Salisbury

References: Standley, Paul C., Bouvardia, in No. Am. Fl. 32: 100-111. 1921. Blackwell, Will H. Jr., Revision of Bouvardia (Rubiaceae), Ann. Mo. Bot. Gard. 55: 1-30. 1968.

Herbs or shrubs, more or less pubescent, the branches terete or angulate; stipules interpetiolar, connate with the petioles to form a sheath, entire or laciniate or aristate; leaves opposite or verticillate, usually petiolate; inflorescence cymose or cymose-corymbose, flowers usually large, white, yellow, or red, rarely solitary; hypanthium subglobose or turbinate; calyx 4-(5-)lobate, the lobes short or elongate, erect or spreading, persistent, often with intermediate teeth; corolla tubular or salverform, the tube glabrous within or pilose, the limb 4-lobate, the lobes short or elongate, erect or spreading, valvate in bud, glabrous or pubescent within; stamens 4, inserted in the throat of the corolla or in the tube above the middle, the filaments very short or elongate; anthers versatile, linear or oblong, included or exserted; ovary 2-celled, the style filiform, the stigma usually bifid; ovules numerous, crowded, the placentae peltately affixed to the septum; capsule didymous-globose, coriaceous, 2-celled, loculicidally bivalvate, the valves finally bifid; seeds numerous, orbicular, imbricate, peltate, compressed, the testa membranaceous, expanded into a broad entire wing.

About 20 species mostly in Mexico, but reaching southward to Honduras and Nicaragua, possibly to Costa Rica. No other species are found in Central America.

Leaves all or mostly in whorls of 3 or 4.

Corolla pink or lavender, the tube about 5 mm. long; leaves slender-petiolate.

B. bouvardioides.

Corolla bright red, the tube 12-16 mm. long; leaves sessile or nearly so.

B. leiantha.

Leaves opposite.

Corolla red or purplish, the tube 2 cm. long or less.

Flowers umbellate at the apex of the branches, few *B. laevis*.

Flowers cymose-corymbose or cymose-paniculate, numerous *B. dictyoneura*.

Corolla white, the tube usually much more than 2 cm. long (sometimes somewhat shorter in *B. multiflora*).

Corolla lobes only 3-5 mm. long, the tube about 2 cm. long *B. multiflora*.

Corolla lobes 6-25 mm. long, the tube usually 2-8 cm. long.

Corolla glabrous outside; leaves glabrous *B. longiflora*.

Corolla variously pubescent outside; leaves pubescent.

B. longiflora var. *induta*.

Bouvardia buvardioides (Seem.) Standl. N. Am. Fl. 32: 102. 1921. *Hedyotis buvardioides* Seem. Bot. Voy. Herald 296. 1856. *Bouvardia pallida* Standl. Journ. Wash. Acad. Sci. 14: 245. 1924. *Flor de dolores*; *jazmín lila*.

Occasional on the Pacific slope of the central region, 1,400-1,800 m., on brushy slopes of moist banks; Guatemala; Escuintla; Sacatepéquez. Mexico; El Salvador.

A shrub about 1 m. high or more, often subscandent or pendent from banks, the young branches minutely puberulent; stipule sheath 2-3 mm. long, subulate-acuminate and glandular-laciniate; leaves mostly ternate, on petioles as much as 12 mm. long but usually shorter, lanceolate to oblong-ovate, 3-10 cm. long, 1-4.5 cm. broad, acuminate or long-acuminate, at the base acute or obtuse, thin, sparsely scaberulous or glabrate above, paler beneath and puberulent, at least along the nerves; inflorescences cymose-corymbose, 5-12 cm. broad, dense and many-flowered, the bracts often large and leaflike, the slender petioles 2-4 mm. long, puberulent; hypanthium hemispheric, puberulent; calyx lobes oblong-linear, 2-3 mm. long; corolla lavender or pale purple, glabrous outside, the stout tube 5 mm. long dilated upward, the lobes ovate-oblong, 3 mm. long, obtuse, glabrous within; filaments exserted; capsule subglobose, 3 mm. broad; seeds broadly winged.

In spite of its abundant flowers, the plant is not a showy one nor very handsome, the flower color being not at all attractive. The shrub is plentiful on roadside banks along the road between Alotenango and Escuintla. We have followed Blackwell in reducing *B. pallida* to *B. buvardioides* with some hesitation. The range is a disrupted one and the plants from Guatemala and adjacent Chiapas have some difference which Blackwell has considered minor.

Bouvardia dictyoneura Standl. N. Am. Fl. 32: 109. 1921. *B. matudae* Lundell, Lloydia 2: 105. 1939. *B. venosissima* Lundell, Bull. Torr. Bot. Club 66: 602. 1939. *B. pachecoana* Standl. & Steyer. Field Mus. Bot. 23: 22. 1943 (type from San Marcos, Standley 86226).

Wet mixed forest of the western highlands extending eastward to Volcán de Atitlán, 1,200-3,000 m.; Suchitepéquez (southern slopes of Atitlán); Quezaltenango (western slopes of Volcán de Zunil); San Marcos (Tacaná and Tajumulco). Mexico (Chiapas, the type from Chicharras).

A slender shrub 1-2.5 m. high, the branches glabrous or sparsely pilose at the nodes; stipules short, subulate; leaves opposite, sessile or on very short petioles, lance-ovate or oblong-lanceolate to oblong-ovate, 5-11 cm. long, 2-5.5 cm. broad, narrowly long-attenuate to the apex, rounded or subcordate at the base, rather firm, very finely and closely reticulate-veined, glabrous or practically so, usually ciliate when young, the lateral nerves 5-6 on each side; inflorescence cymose-corymbose, rather dense and many-flowered, the slender pedicels 3-10 mm. long; hypanthium glabrous, 1-1.5 mm. long; calyx lobes linear-subulate, 2.5-3.5 mm. long; corolla coral-red or dull red, glabrous outside, the tube about 11 mm. long, the lobes ovate-oval, 3.5-4 mm. long, acutish, ascending; capsule subglobose, 4-5 mm. broad, costate and reticulate-veined.

Bouvardia laevis Mart. & Gal. Bull. Acad. Sci. Brux. 11(11): 236. 1844. *B. nubigena* Standl. & Steyer. Field Mus. Bot. 22: 382. 1940 (type from Jutiapa, *Steyermark 31901*).

Wet thickets or forest, 1,500-2,000 m.; Jutiapa; Jalapa. Mexico.

A branched shrub 1 m. high glabrous throughout; stipule sheath short, long-cuspidate and sometimes setiferous; leaves opposite, on petioles 4-8 mm. long, ovate to broadly ovate or subrhombic-ovate, 3-5 cm. long, 1.5-3 cm. broad, acuminate or long-acuminate, at the base rounded or obtuse, slightly paler beneath, the lateral nerves 4 on each side; flowers umbellate at the ends of the branches, usually 3-4, or arranged in small few-flowered cymes, the pedicels 1 cm. long or less; hypanthium obovoid, 3 mm. long, obtuse at the base or acutish, the calyx lobes linear, green, 6-7 mm. long or in fruit 10 mm. long, scaberrulous on the margins; corolla red, glabrous, the tube 2 cm. long, 2 mm. broad, the lobes ovate-oblong, suberect, 4 mm. long, obtuse; capsule subdidymous-globose, 8 mm. broad and 6 mm. high, broadly rounded at the base.

Bouvardia leiantha Benth. Pl. Hartw. 85. 1841. *Jacinto; jazmín tinto; clarincillo*.

Type collected near Tejar and Chimaltenango, Chimaltenango, *Hartweg 583*; common and widely distributed in the mountains, 900-2,100 m., brushy slopes or open banks, often in oak or pine forest; Baja Verapaz; Zacapa; Chiquimula (near Quezaltepeque); Jalapa; Jutiapa; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango; Huehuetenango; Sololá; San Marcos. Mexico to Nicaragua.

Usually a shrub about 1 m. high, sometimes lower and almost wholly herbaceous, the slender branches densely puberulent and villous at first; stipule sheath 5 mm.

long or less, short-cuspidate, sometimes glandular-dentate; leaves in whorls of 3 or 4, sometimes opposite, sessile or nearly so, ovate to broadly ovate or ovate-oblong, 3-7 cm. long, 1.5-3 cm. broad, acute or acuminate, rounded at the base, bright green above and scaberulous or villosulous, short-villous beneath or densely white-tomentose; inflorescence cymose-corymbose, densely many-flowered, 4-9 cm. broad or smaller, the pedicels 1-4 mm. long; hypanthium 1.5 mm. long, hirsutulous or glabrate; calyx lobes lance-linear, 2-4 mm. long, ciliate and often hirsutulous; corolla bright red or scarlet, glabrous outside, the tube 12-16 mm. long, the lobes rounded-ovate, 2-3 mm. long, obtuse or rounded, erect or ascending; capsule subglobose, about 4 mm. long.

A rather pretty plant when flowering abundantly, but too often only a few flowers appear upon a shrub, especially during the dry months.

Bouvardia longiflora (Cav.) HBK. Nov. Gen. Sp. Pl. 3: 386. 1820. *Aeginetia longiflora* Cav. Anal. Cienc. Nat. 3: 130. 1801; Cav. Icon. t. 572, f. 1. 1801. *B. glabra* Polak. Linnaea 41: 565. 1877. *B. dolichantha* Loesner, Verh: Bot. Ver. Brandenb. 65: 106. 1923 (type, Huehuetenango, *Seler* 2883). *B. glabra* var. *obtusa* Loesner, l.c. (type, *Seler* 2920). *Jazmín de monte*; *jazmín*. Figure 11.

Moist or wet thickets or wooded rocky slopes and banks, mostly 1,800-2,000 m.; Alta Verapaz (cultivated); San Marcos; Quezaltenango; Huehuetenango; Totonicapán; Quiché; Sololá; Chimaltenango; Jalapa; Jutiapa. Mexico; Honduras; Costa Rica (cultivated and escape).

A shrub, usually 1-1.5 m. high but often lower, the branches glabrous or nearly so; stipules 3-6 mm. long, lance-triangular, lobate or lacinate; leaves opposite, on stout petioles 2-6 mm. long, glabrous, ovate to lanceolate or linear-lanceolate, 2-4.5 cm. long, 0.6-1.8 cm. broad, acute to acuminate, acute to attenuate at the base, concolorous or nearly so; flowers solitary and terminal, or commonly in 3-flowered cymes in the upper leaf axils, sessile or short-pedicellate; hypanthium glabrous, 2-3 mm. long, the calyx lobes linear to lanceolate, foliaceous, 6-18 mm. long, scaberulo-ciliate; corolla white, glabrous, the slender tube 4-8.5 cm. long, 2-3 mm. thick, the lobes spreading, oblong or oblong-oval, 1.5-3 cm. long, 7-10 mm. broad, acute or acuminate; capsule subglobose, 8 mm. in diameter, broadly rounded at the apex; seeds suborbicular, 2-3 mm. long, dark brown, broadly winged.

The large white flowers are fragrant and showy. *Bouvardia glabra* is a luxuriant form described from Costa Rica and probably based on cultivated materials. The senior author, long-time specialist in the Rubiaceae, apparently thought that the Central American material and that from Mexico could not be reasonably separated. The junior author is responsible for the final treatment and has followed fairly closely Standley's thinking in the matter — quite different from that of Dr. Blackwell.

Bouvardia longiflora var. **induta** Robinson, Proc. Am. Acad. 45: 404. 1910. *B. induta* Standl. No. Am. Fl. 32: 109. 1921. *Jazmín; jazmín de monte*.

Open wooded slopes, often in pines, 1,000-1,900 m.; Huehuetenango. Mexico (Chiapas).

Differing from the species in being hirtellous in most parts.

The variation may be only a local and rare one. It is probable that it is to be found also in the Mexican state of Vera Cruz.

Bouvardia multiflora (Cav.) Schult. Mant. Syst. Veg. 3: 118. 1827. *B. heterophylla* Standl. No. Am. Fl. 32: 107. 1921 (type from Santa Rosa, Heyde & Lux 3137). *B. latifolia* Standl. 1. c. 111. *B. salvadorensis* Steyererm. Ceiba 4: 302. 1955. *Jazmín de monte*.

Moist or dry thickets, 1,000 to 1,500 m. (in Guatemala); Santa Rosa; Huehuetenango. Mexico; El Salvador; possibly Nicaragua.

A shrub, the slender branches pruinose-puberulent when young; stipules short, long-cuspidate, sometimes lacinate; leaves opposite, on slender petioles 2-4 mm. long, suborbicular to broadly ovate or lance-ovate, 2-4 cm. long, 1-3 cm. broad, acuminate to attenuate, at the base obtuse to truncate and usually abruptly short-decurrent, bright green and glabrous above, paler beneath, glabrous, or puberulent along the veins; cymes 3-5-flowered, the slender pedicels 2-8 mm. long; hypanthium 1.5 mm. long, obscurely pruinose-puberulent; calyx lobes lanceolate or lance-linear, 2.5-5 mm. long, glabrous; corolla white, glabrous outside, the tube 18-21 mm. long, 2-3 mm. thick above, the lobes triangular-oblong, 4-5 mm. long, obtuse or acutish, ascending, glabrous within.

We have followed Dr. Blackwell who considers this species to be a common one distributed from northern Mexico to Nicaragua. It is rare in Guatemala.

CALYCOPHYLLUM de Candolle

Trees with terete branchlets; leaves opposite, petiolate; stipules interpetiolar, narrow, caducous; flowers small, white, in branched terminal corymbiform panicles, sessile or short-pedicellate, in bud enclosed in membranaceous bracts; hypanthium oblong, terete, the calyx truncate, but often developing a single large, foliaceous, petiolate white blade; corolla short-funnelform, the tube short, with villous throat, the limb 6-8-lobate, the broad lobes imbricate in bud or contorted, one lobe exterior; stamens inserted in the corolla throat, the filaments subulate, the anthers oblong, versatile, exserted; ovary 2-celled, the style filiform, glabrous, the 2 branches linear-oblong, obtuse; ovules numerous, imbricate, the placentae adnate to the septum; capsule oblong-cylindric, truncate, 2-celled, septicidally bivalvate, the coriaceous valves entire; seeds few or numerous, imbricate, usually minute, the testa produced at each end into an elongate wing.

Three other species are known, all South American.

Calycophyllum candidissimum (Vahl) DC. Prodr. 4: 367. 1830. *Macrocnemum candidissimum* Vahl, Symb. Bot. 2: 38. 1791. *Salamo*; *cáscara de salamo*; *guayabillo*; *canela*; *palo de peine* (fide Rojas); *Calán* (Izabal, fide Blake); *madroño* (Izabal); *ucá*; *chulub* (reported from Guatemala but not verified by the authors). Figure 16.

Common on the Pacific coastal plains, in forest or open fields, also in lowland forests of western Guatemala, ascending to about 900 m.; El Progreso; Zacapa; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Retalhuleu; Huehuetenango. Southern Mexico; El Salvador to Panama and Colombia; Cuba.

A tall tree, sometimes 20 m. high or more, with a rather slender trunk, often supported by small buttresses, the pale bark similar to that of guava; branchlets glabrous or nearly so, often hirsute at the nodes; stipules triangular or lanceolate, 1 cm. long or less; petioles 0.5-3.5 cm. long; the blades oval or ovate, 5-12 cm. long, 1.5-7.5 cm. broad, abruptly acuminate or cuspidate-acuminate, acute or obtuse at the base and abruptly short-decurrent, bright green and glabrous above, paler beneath and usually sparsely hirsute on the costa; corymbs few- or many-flowered, the flowers cymose-glomerate, the large brown bracts caducous; hypanthium 2.5-3 mm. long, setose-hirsute or glabrate; calyx in many of the flowers expanded into a white limb, this ovate-rhombic to subreniform, 1.5-3 cm. long, rounded at the apex, obtuse to subcordate at the base and abruptly decurrent into a petiole 1-1.5 cm. long; corolla white, the tube 3 mm. long, glabrous or sparsely puberulent outside, the lobes slightly longer than the tube, obtuse or subacute, the throat densely white-villous; stamens long-exserted; capsule 6-10 mm. long, 2.5-4 mm. thick, compressed and shallowly bisulcate, costate, acute at the base; seeds produced at each end into a short acute wing.

One of the common trees of the Pacific plains, and of the Pacific coast generally of Central America. When in flower, at the end of the rainy season, it is exceedingly conspicuous and handsome because of the great abundance of enlarged calyx lobes which give the effect of a dense mantle of white flowers. These lobes are at first creamy, then almost pure white, and remain so for a long time, but finally turn brown and persist upon the tree for many weeks, sometimes after the leaves have fallen, giving it then a withered appearance. The name "guayabillo" refers to the fact that the bark is so much like that of *Psidium guajava* in general appearance. In some parts of Honduras the tree is called "colorado," and in Costa Rica "surrá," "salamo," and "madroño." The wood is pale brown, hard, heavy, strong, highly elastic, fine-textured, usually straight-grained, easy to work and finishes smoothly. Under the name "lancewood" it is imported from Cuba into the United States for use in making archery bows. In Guatemala, as elsewhere in Central

America, it is utilized for making fine-toothed combs, and also for tool handles and other purposes for which a strong, fine-grained, and hard wood is required.

CEPHAELIS Swartz

Reference: Molina R., Antonio, Revisión de las Especies de Cephaelis de México, Centro America y las Antillas, Ceiba 4: 1-38. 1953.

Shrubs or small trees, rarely herbs, glabrous or pubescent; stipules free or connate, usually persistent; leaves opposite, petiolate or sessile; flowers capitate, subtended by an involucre of usually sessile, free or connate, often brightly colored bracts, the heads terminal or axillary, simple or branched, sessile or pedunculate; calyx short or elongate, persistent, 4-7-dentate; corolla funnelform or salverform, the tube straight, normally elongate, the throat villous or naked, the lobes 4-5, valvate in bud; stamens inserted in the corolla throat, the filaments generally short, the linear anthers included or exerted; ovary commonly 2-celled, the cells 1-ovulate; fruit drupaceous, containing 2 bony, smooth or costate nutlets, these mostly longitudinally sulcate on the flat inner face.

A large genus of tropical America and Africa, most of the species South American; about 15 are known from Central America. *C. ipecacuanha* (Brot.) A. Rich., of the lowlands of Panama and northern South America, furnishes part of the ipecac of commerce. It has been collected as far north as Nicaragua, and is usually given the name "raicilla." The drug is obtained from the slender knotted roots, which are about 6 mm. in diameter. The plant is a low simple shrub with subsessile leaves and stipules divided into thread-like lobes. The genus *Cephaelis* is not a well marked one and is difficult to separate from *Psychotria*, but for practical purposes, especially in case of the very numerous South America species, it constitutes a most convenient segregate.

Plants densely pilose or hirsute; flower heads terminal, pedunculate*C. tomentosa*.
Plants glabrous or practically so.

Leaves sessile or practically so*C. chiapensis*.

Leaves conspicuously petiolate.

Flowers heads long-pedunculate, terminal*C. elata*.

Flower heads sessile.

Heads all terminal*C. glomerulata*.

Heads mostly axillary, sometimes also terminal*C. axillaris*.

***Cephaelis axillaris* Swartz, Prodr. Veg. Ind. Occ. 45. 1788.**

Wet forest, mountains of Zacapa (Sierra de las Minas) and Chiquimula (Cerro Brujo), at 1,700-2,500 m. Extending southward to Panama; Colombia; Venezuela; West Indies.

A glabrous shrub 1.5 m. tall or less, with green stems, simple or sparsely branched; stipules bilobate, the lobes obtuse or acute, persistent; leaves on short slender petioles, obovate-oblong or oblong-oblancheolate, mostly 9-13 cm. long and 2.5-4 cm. broad, gradually or abruptly acuminate, acute or attenuate at the base, pale beneath; flower heads chiefly or wholly axillary, closely sessile, about 1 cm. in diameter or in fruit larger, the numerous small bracts green or purplish; corolla white or creamy white, inconspicuous; fruits turquoise or prussian blue.

Cephaelis chiapensis Standl. Field Mus. Bot. 4: 295. 1929.
Evea chiapensis Standl. Contr. U. S. Nat. Herb. 23: 1392. 1926
(type from Cerro del Boquerón, Chiapas).

Known in Guatemala only from *Bernoulli & Cario 1710*, collected in 1877 and labeled as coming from Retalhuleu; probably to be found on the wetter slopes of the mountains above Retalhuleu.

A glabrous shrub with slender branches; stipule sheath very short, bearing on each side 2 stiff setae about 3 mm. long; leaves sessile or nearly so, thin, oblong-elliptic or oblong-lanceolate, 7-11 cm. long, 2.5-4 cm. broad, acute to long-acuminate, narrowed to the obtuse or acute base, green and lustrous above, paler beneath, the lateral nerves about 9 pairs; heads terminal, on peduncles 1 cm. long or less, rather few-flowered; outer bracts few, apparently pale green, broadly ovate or deltoid-ovate, 10-15 mm. long, acute or acuminate, thin.

Cephaelis elata Swartz, Prodr. Veg. Ind. Occ. 45. 1788.
Cephaelis punicea Vahl, Eclog. Amer. 1: 19. 1796. *Evea elata*
Standl. Contr. U. S. Nat. Herb. 18: 123. 1916.

Wet forest, at scattered localities: Izabel and Alta Verapaz, at or little above sea level; Chiquimula (Cerro Tixixí, 500-1,500 m.); Suchitepéquez (Volcán de Zunil, 1,200 m.); San Marcos (Volcán de Tajumulco, at 1,300-1,500 m.). Southern Mexico and British Honduras through much of Central America to West Indies; Colombia.

A glabrous shrub or small tree, 1.5-6 m. tall; stipules short, the lobes broad, broadly rounded at the apex; leaves slender-petiolate, oblong-lanceolate to elliptic-oblong, 10-25 cm. long, 3.5-7 cm. broad, acuminate, acute to attenuate at the base, with numerous pairs of lateral nerves; peduncles terminal, usually greatly elongate, bearing 1 or sometimes 3 large heads, the 2 outer bracts rose-red or dull dark red, rounded-ovate, 2.5-4 cm. long, broadly rounded to acutish at the apex, rarely green or yellow (f. *lutea* Standl., of Costa Rica); corolla white, well exerted from the bracts but soon deciduous, its lobes spreading.

The shrub is a handsome and showy one because of the brightly colored bracts of the inflorescence.

Cephaelis glomerulata Donn.-Sm. Bot. Gaz. 16: 12, *t. 1*. 1891.
Psychotria glomerulata Steyererm. Mem. N. Y. Bot. Gard. 23: 670.
1972. Figure 52.

Type from swampy woods of Río Dulce, Izabal, at sea level, *J. D. Smith* 1637; wet forests of Izabal and Petén, at or little above sea level. Along or near the Atlantic coast from British Honduras to Panama; Colombia.

A glabrous shrub 1-2 m. high, sparsely branched; stipules united to form a short truncate sheath; leaves short-petiolate, somewhat coriaceous, oblong-lanceolate or elliptic-oblong, 9-15 cm. long, 3.5-5 cm. broad, rather abruptly acuminate, acute at the base, with about 14 pairs of lateral nerves; flower heads terminal, sessile, about 2 cm. broad and 1.5 cm. high, the bracts pale green, coriaceous, the broad outer ones obovate, rounded at the apex, the inner ones spatulate; calyx unequally subulate-dentate; corolla white, exserted beyond the bracts; fruit ovoid, 6 mm. long, blue.

Cephaelis tomentosa (Aubl.) Vahl, Eclog. Amer. 1: 19. 1796.
Tapogomea tomentosa Aubl. Pl. Guian. 160. 1775. *Evea tomentosa*
Standl. Contr. U. S. Nat. Herb. 18: 123. 1916. *Madre* (Petén).

Common in wet forest or second-growth thickets, Izabal, at or near sea level; Petén; Alta Verapaz (Chirriacté and Cubilgüitz, on limestone at 300 m.); Quiché (Finca Chaila, Zona Reina, 330 m.); Huehuetenango (Ixcán). British Honduras. Southern Mexico to Bolivia and Amazonian Brazil.

A slender shrub commonly 1-2 m. tall, often almost wholly herbaceous, sparsely branched, densely pilose or hirsute throughout; stipules persistent, deeply cleft into narrow erect lobes; leaves membranaceous, short-petiolate, lanceolate to ovate-elliptic, mostly 8-16 cm. long, narrowly long-acuminate, acute to attenuate at the base; heads large, terminal, on long or short peduncles; bracts broadly ovate, 3-5 cm. long, deep dull red, long-connate above the base, acute or short-acuminate; corollas yellow, shorter than the outer bracts; fruit blue.

Called "oropelo" in Oaxaca and "cresta de gallo" in Tabasco. A showy and rather handsome shrub of wide range in tropical America, and certain to attract the attention of every amateur collector. Actually, it is perhaps showier in herbarium specimens than when growing, for often the plants are half hidden among other shrubs or weeds. It may be seen in abundance along the railroad passing through the wet lowland forest between Puerto Barrios and Gualán.

CEPHALANTHUS Linnaeus

Erect shrubs or small trees, glabrous or pubescent; leaves opposite or verticillate, short-petiolate; stipules short, intrapetiolar; inflorescence globose, flowers small,

white or yellowish, sessile and forming very dense, many-flowered heads, intermixed with setaceous or paleaceous bractlets; hypanthium turbinate; calyx short-tubular, unequally 4-5-dentate or 4-lobate, often glanduliferous; corolla tubular-funnelform, the throat glabrous or pilose, the limb 4-5-lobate, the lobes erect or spreading, imbricate in bud, one lobe exterior, often with glands in the sinuses; stamens 4, inserted in the corolla throat, the filaments short, the anthers dorsifixed, bicuspidate at the base; ovary 2-celled, the style filiform, the stigma capitate or clavate; ovules solitary, pendulous from the top of the cell; fruit turbinate, 2-4-celled, the cells indehiscent, 1-seeded, or one or more of them empty; seeds oblong, covered at the apex by a white aril.

The genus is a small one of about seven species in America, Africa, and Asia. Only two are known from North America, one or two in South America.

Calyx glabrous or sparsely pubescent at the base.....*C. occidentalis*.
Calyx densely sericeous pubescent with short hairs.....*C. salicifolius*.

Cephalanthus occidentalis L. Sp. Pl. 95. 1753. *Guayabillo*.
Figure 21.

Swamps near sea level; Petén; Izabal. British Honduras (Maskall); Honduras; through Mexico to the United States and New Brunswick; Cuba; Old World.

In Guatemala a shrub of 1.5 m., but often much larger or even a small tree (reported in Honduras as 5.5 m. high); stipules 2-4 mm. long, deltoid, acute or acuminate, usually with glands along the margin; leaves opposite or ternate, the petioles mostly less than 2 cm. long, the blades ovate to rarely narrowly lanceolate, 10-15 cm. long, 8.5 cm. broad or less, long- or short-acuminate, subcordate to acute at the base, glabrous above or nearly so, beneath almost glabrous or sometimes densely pubescent (var. *pubescens* Raf.); peduncles terminal and axillary, simple or branched, 3-10 cm. long; heads 6-12 mm. in diameter (excluding the corolla); bractlets filiform-clavate; hypanthium and calyx together 2-3 mm. long, glabrous, or sparsely long-pilose at the base, the calyx about 1 mm. long, shallowly dentate; corolla 5-9 mm. long, white or cream, glabrous outside, the limb with a small black gland in each sinus; capsule 4-8 mm. long.

Known in the United States by the name "button-bush." The flowers are sweet-scented.

Cephalanthus salicifolius Humb. & Bonpl. Pl. Aequin. 2: 63. 1809.

To be expected in the pine or pine-oak forests at 700-1,500 m. or perhaps along river banks down almost to sea level. Mexico (north and central); Honduras. Not now known from Guatemala or British Honduras.

Shrubs or small trees; leaves opposite or ternate, short petiolate, glabrous, linear-lanceolate to narrowly oblong, 4.5-12 cm. long and 1-2.5 cm. broad, mostly acute or

acuminate at the apex and acute or rounded at the base; peduncles mostly 2-4 cm. long; the inflorescence capitate or globose, 2-3 cm. in diameter at anthesis; calyx and hypanthium 2-2.5 mm. long, sericeous with short hairs, the calyx about 1 mm. long, 4-5-lobate; corolla 6-8 mm. long, glabrous outside, sparsely pilose within, usually with small black glands in the sinu.

CHIOCocca P. Browne

Shrubs or small trees, often scandent or clambering, glabrous or pubescent, branches terete; stipules broad, persistent, usually cuspidate. Leaves opposite, petiolate, membranaceous to coriaceous; inflorescence of axillary racemes, simple or paniculate, often secund; flowers small, whitish, pedicellate; hypanthium ovoid or turbinate, compressed; calyx 5-lobate, persistent, the lobes short; corolla funnelform, the throat glabrous, the limb 5-lobate, the lobes valvate, spreading or reflexed; stamens 5, inserted on the disk inside the corolla, the filaments pilose; anthers linear, basifixed, included or exerted; ovary two-celled, the style filiform with clavate or cylindric stigma which is entire or bilobate; ovules solitary, pendulous from the apex of the cell; fruit drupaceous, small, somewhat fleshy, usually orbicular and much compressed, bicarpidiate.

This genus is in need of revision and most certainly there are more species in Guatemala than the five given here. *Chiococca alba* (L.) Hitchc. as treated here is certainly a composite species. The genus is a common one through most of northern Central America, perhaps one of the commonest members of the Rubiaceae at low and middle elevations and is to be found in almost any moist ravine or creek valley in Guatemala, British Honduras, or Honduras.

The genus perhaps contains 20 species or more. Only those listed here have been proposed for Central America and Panama.

Leaves lance-linear, only 2-4 mm. broad *C. steyermarkii*.

Leaves lanceolate to ovate, much broader.

Leaves pilose on both surfaces *C. semipilosa*.

Leaves glabrous.

Anthers nearly or quite equaling the corolla lobes, sometimes longer, the filaments exerted *C. phaenostemon*.

Anthers only slightly exceeding the corolla tube, or included, the filaments wholly included.

Limb of the corolla 8-10 mm. broad; calyx lobes semiorbicular to almost obsolete; leaf blades mostly 3.5-6 cm. broad; fruit but little compressed.

C. pachyphylla.

Limb of the corolla 4-6 mm. broad; calyx lobes deltoid to lance-linear, acute or acutish; leaf blades mostly narrower; fruit strongly compressed *C. alba*.

Chiococca alba (L.) Hitchc. Rept. Mo. Bot. Gard. 4: 94. 1893.
Lonicera alba L. Sp. Pl. 175. 1753. *C. racemosa* L. Syst. Nat. ed. 10.
 917. 1759. *C. macrocarpa* Mart. & Gal. Bull. Acad. Brux. 11, pt. 1:
 231. 1844. *C. petenensis* Lundell, Wrightia 5: 7. 1972 (type from

Petén, Contreras 2439). *C. vestita* Lundell, l.c. 8 (type from Petén Lundell 16425). *C. vestita* var. *glaberrima* Lundell, l.c. 9 (type from Petén, Lundell 16425a). *Lágrimas de Guadalupe* (fide Aguilar).

Common in thickets and forest in many regions, especially in the tierra caliente of both coasts, ascending to about 1,500 m.; Petén; Alta Verapaz; Izabal; Chiquimula; Jalapa; Jutiapa; Zacapa; Santa Rosa; Esquintla; Guatemala; Sacatepéquez; Suchitepéquez; Quezaltenango; Huehuetenango. Florida and southwestern Texas; Mexico; British Honduras to El Salvador and Panama; West Indies; widely distributed in South America.

Usually a shrub, rarely a small tree, often scandent, the branchlets glabrous or obscurely puberulent; stipules 1-2 mm. long, mucronate or subulate-acuminate; petioles 2-10 mm. long, the blades very variable, mostly ovate or oval-ovate, sometimes lanceolate, 3-9 cm. long, 1-4.5 cm. broad, commonly short-acuminate, rounded and short-decurrent to acute at the base, the lateral nerves inconspicuous; inflorescence racemose or paniculate, with few or many flowers; calyx and hypanthium 2.5 mm. long, the calyx lobes subulate to broadly deltoid; corolla 6-8 mm. long, white or cream; anthers included or the tips rarely exserted; fruit white, juicy, orbicular, 4-8 mm. long, strongly compressed; seeds dark brown, 3-4 mm. long, punctulate.

Called "lágrimas de San Pedro" and "aceitillo" in El Salvador; "cainca" and "canchacche" in Yucatan. There is a possibility that more than one species is represented by Guatemalan specimens.

Chiococca pachyphylla Wernham, Journ. Bot. 51: 323. 1913. *C. belizensis* Lundell, Am. Midl. Nat. 29: 492. 1943 (type from Cow Pen, near Monkey River, Toledo District, British Honduras, *Gentle* 4115). *C. rubriflora* Lundell, Wrightia 5: 7. 1972 (type from Petén, Contreras 9110).

Moist mountain forest, 1,500 m. or lower; Petén; Suchitepéquez; San Marcos; Huehuetenango. Mexico; British Honduras; El Salvador; Honduras; Nicaragua.

A scandent shrub (in Guatemala), sometimes erect or a small tree, glabrous except for the inflorescence; stipules 2-4.5 mm. long, subtruncate and mucronate; petioles 8-14 mm. long, thick, the blades elliptic to broadly oblong or ovate, 7-14 cm. long, 2.5-6 cm. broad, short-acuminate to obtuse, rounded to acute at the base and abruptly short-decurrent, coriaceous, the lateral nerves rather prominent beneath; inflorescence many-flowered, paniculate, often equaling or exceeding the leaves, the branches obscurely puberulent or glabrous, the pedicels 2-5 mm. long; calyx and hypanthium 2.5-3 mm. long, the calyx lobes very short; corolla 7-8 mm. long, often reddish outside, white or cream within; anthers semiexserted; fruit subglobose, usually little compressed, 6-7 mm. in diameter, white or greenish white.

Called "snowberry" in British Honduras.

Chiococca phaenostemon Schlecht. *Linnaea* 9: 594. 1834.
Trueno (Huehuetenango).

Widely distributed, at 1,300-3,000 m., in humid forest or thickets, sometimes on open rocky hillsides; Alta Verapaz; Baja Verapaz; Chiquimula; Quiché; Sacatepéquez; Huehuetenango; San Marcos; Quezaltenango; Chimaltenango; Quiché. Southern Mexico to Honduras.

A shrub or small tree, often 5-8 m. tall, commonly erect and with no tendency to climb, glabrous or nearly so; stipules 2-3 mm. long, mucronate or subulate-cuspidate; petioles 3-10 mm. long, the blades mostly ovate-oblong or lance-oblong, 4-12 cm. long, 1.5-5.5 cm. broad, acuminate or long-acuminate, rounded to acutish at the base and often short-decurrent, coriaceous, the lateral nerves obscure beneath; racemes usually paniced, often longer than the leaves, many-flowered, the pedicels 5 mm. long or less; calyx and hypanthium 2-3 mm. long, the calyx lobes short, broadly deltoid, obtuse or acutish; corolla 5-8 mm. long, yellowish white; anthers 3-4 mm. long; fruit white, compressed, 5-7 mm. long.

Growing as a small tree, this is plentiful at many places of the central region, as on the lower slopes of Volcán de Acatenango, near Chimaltenango.

Chiococca semipilosa Standl. & Steyerl. *Field Mus. Bot.* 22: 279. 1940. Figure 42.

In thickets or forest, 400-1,400 m.; endemic; Chiquimula (type from Cerro Caracol north of Quezaltepeque, *Steyermark* 31406; also at several other localities); Jalapa; Huehuetenango. Honduras.

A weak subscandent shrub 1.5-2 m. long, the branchlets glabrous; stipules minute, cuspidate; petioles 2-3 mm. long, the blades firm-membranaceous, lanceolate to ovate, 5-8 cm. long, 1.5-3 cm. broad, long-acuminate, acute and often decurrent at the base, sparsely spreading-pilous above, densely short-hirtellous beneath; racemes mostly 5-7-flowered, half as long as the leaves or less, the rachis hirtellous, the slender pedicels 3-7 mm. long; calyx 1 mm. long, deeply dentate, the teeth triangular, acute; fruit oval-orbicular, somewhat compressed, 4-5 mm. long, white, sparsely hirtellous.

Chiococca steyermarkii Standl. *Field Mus. Bot.* 22: 280. 1940.

Type from San Marcos, Río Vega, near San Rafael and Guatemala-Mexico boundary, at 2,500-3,000 m., *Steyermark* 36237.

An erect, rather densely branched shrub 2-3 m. high, the branchlets puberulent; stipules subulate from a broad base; leaves small, subcoriaceous, the petioles scarcely 1.5 mm. long, the blades lance-linear, 15-23 mm. long, 2-4 mm. broad, gradually narrowed to the obtuse apex, acute at the base, glabrous, the lateral nerves obsolete; flowers axillary and solitary or short-racemose, the pedicels filiform, recurved, 5-8 mm. long, minutely puberulent; hypanthium glabrous; calyx teeth subulate, 1 mm.

long; corolla white, 10-11 mm. long, glabrous; anthers included; fruit white, subcompressed, suborbicular, 7 mm. long.

The species is perhaps the best marked one of the whole genus, on account of its small narrow leaves.

CHIONE De Candolle

Trees or shrubs, glabrous or nearly so; stipules small, caducous, commonly short-connate; leaves opposite, coriaceous, petiolate; flowers small, white, in terminal pedunculate cymes or corymbs; hypanthium turbinate; calyx cupular, 5-dentate, 5-lobate, or subentire, persistent; corolla funnelform, short and broad, the throat naked, the limb 5-6-lobate, the lobes imbricate in bud, 2 of them exterior; stamens 5-6, inserted above the base of the corolla tube, the filaments stout, the anthers large, exserted, linear-oblong, dorsifixed; ovary 2-celled, the style stout, the branches linear-oblong, obtuse, exserted; ovules solitary, pendulous from the apex of the cell; fruit drupaceous, ovoid or ellipsoid, the stone osseous, sulcate, 2-celled; seeds elongate, terete.

About 15 species in tropical North America. Six or seven species, Mexico to Panama, the others in the West Indies. *Chione chiapasensis* Standl., described from Palenque, Chiapas, may well be expected in Petén.

Chione guatemalensis Standl. & Steyerl. Field Mus. Bot. 22: 174. 1940. Figure 44.

Known only from the vicinity of the type locality, banks of Río Dulce above Livingston, Izabal, at sea level; type, *Steyermark* 39375.

A shrub or small tree, glabrous throughout; stipules caducous; leaves on stout petioles 2-2.5 cm. long, subcoriaceous, narrowly elliptic-oblong to elliptic, 14-17 cm. long, 4.5-8 cm. broad, shortly obtuse-acuminate, acute at the base, with about 9 pairs of lateral nerves; inflorescence long-pedunculate, terminal, few-flowered cyme, much shorter than the leaves, the flowers on rather long, stout pedicels; hypanthium clavate, the calyx 2 mm. long, its lobes triangular, acute, erect; corolla white, 5 mm. long, the broad tube obconic, the broad rounded lobes less than half as long as the tube, recurved; filaments short-exserted, the oblong-linear anthers 3 mm. long; fruit oblong, obtuse at base and apex, fleshy, greenish, turning mango-orange, red in the upper half, 2 cm. long, 8-9 mm. broad.

In *C. chiapasensis* the leaves are excavate and barbate beneath in the nerve axils; in *C. guatemalensis* the axils are neither excavate nor barbate.

CHOMELIA Jacquin

Shrubs or small trees, usually armed with long stout axillary spines, the branchlets terete; leaves opposite, petiolate, commonly membranaceous; stipules

interpetiolar, deciduous, acuminate; flowers small, white, bracteolate, in pedunculate axillary cymes; hypanthium oblong or turbinate; calyx 4-lobate, the lobes narrow and elongate, equal or unequal, persistent; corolla salverform, with slender elongate tube, the throat glabrous or pilose, the limb 4-lobate, the lobes valvate in bud or with slightly imbricate margins, corniculate-appendaged outside near the apex; stamens 4, inserted in the corolla throat; anthers linear or sagittate, dorsifixed, sessile, included or subexserted, their basal lobes acute or attenuate; ovary 2-celled, the style filiform, with 2 short branches; ovules solitary, pendulous from the apex of the cell; fruit drupaceous, small, oblong, subterete, the stone osseous, 2-celled; seeds pendulous, cylindric.

A genus of few species, all except the following one South American. Many authors unite *Anisomeris* with *Chomelia*, here tentatively maintained as distinct. That differs in having no appendages on the corolla lobes.

Chomelia spinosa Jacq. Enum. Pl. Carib. 12. 1760; Stirp. Am. 18. 1763. *Chomelia filipes* Benth. ex Oerst. Vid. Medd. Kjoebenhavn 41. 1852 (type from Granada, Nicaragua). *Anisomeris purpusii* Brandege, Univ. Calif. Publ. Bot. 6: 70. 1914 (type from Chiapas). *C. purpusii* Rusby, Bull. Torr. Bot. Club 52: 138. 1925.

Known in Guatemala only from brushy coastal plains of Escuintla (San José) from a sterile specimen, but doubtless may occur elsewhere along the Pacific coast; growing in dry or moist thickets or forest. Southern Mexico, along the Pacific coast to Panama, southward to northern Brazil.

A shrub or small tree, sometimes 9 m. tall, the young branches mostly brown, armed with stout spines 2.5 cm. long or less, the young branchlets appressed-pilose; stipules 4-8 mm. long, thin, sparsely pilose, subulate-acuminate from a triangular base; leaves often crowded on short lateral branches, the slender petioles 12 mm. long or less, the blades very variable in shape, ovate-orbicular to elliptic or oblong-ovate, 4-8 cm. long, 2-4 cm. broad, usually abruptly short-acuminate, broadly rounded to acute at the base, thinly pilose and green above, pilose beneath, especially along the nerves, with appressed or spreading hairs, with 6-8 pairs of prominent lateral nerves; cymes few-flowered, the very slender peduncles 1.5-3.5 cm. long, the flowers sessile or subsessile; calyx and hypanthium 2-3 mm. long, appressed-pilose; calyx lobes lanceolate or triangular-subulate, unequal, half as long as the hypanthium or shorter; corolla white or creamy white, sericeous outside, the slender tube 12-22 mm. long, the linear-lanceolate lobes 4-6 mm. long, each with a slender elongate horn-like appendage at or just below the apex, the throat glabrous; fruit black or purplish black at maturity and juicy, oval-oblong, 9-12 mm. long.

The general appearance of the shrub suggests the genus *Randia*, except for the flowers and fruit.

CINCHONA Linnaeus

Reference: Popenoe, Wilson, Cinchona, The "Fever-Tree," in Wilson, New Crops for the New World, Macmillan Co., pp. 109-125. 1945.

Trees or shrubs, the branches terete or tetragonous, the bark bitter; leaves persistent, opposite, petiolate, coriaceous or membranaceous; stipules interpetiolar, glandular within at the base, deciduous; flowers small, white, pink, or purplish, fragrant, normally 5-parted but often 4- or 6-parted, in small or large, terminal panicles; hypanthium turbinate, pubescent, the calyx persistent, cupular, 5-dentate; corolla salverform, pubescent, the tube terete or somewhat 5-angulate, glabrous or pilose in the throat, the limb 5-lobate, the lobes spreading, not papillose within, valvate in bud, the margins pilose; stamens 5, inserted in the corolla tube, the filaments short or elongate; anthers included or their apices exerted, linear, dorsifixed; ovary 2-celled, the style slender, its branches short, obtuse, included or subexserted; ovules numerous, the placentae linear, adnate to the septum, upwardly imbricate; capsule ovoid, oblong, or subcylindric, bilobate, 2-celled, many-seeded, septicidally dehiscent from the base upward to the apex; seeds peltate, the testa broadly winged.

Perhaps 20-25 species, ranging from Costa Rica southward, chiefly along the Andes, to Bolivia. Authors are not in agreement as to the number of species to be recognized, principally because of the difficulty in finding characters for their separation. Most of the species have been based upon minute characters, some of which appear to be of horticultural rather than systematic importance. The genus is one of the most important of all American Rubiaceae because it is the source of the drug quinine or cinchona, formerly used generally in the treatment of malaria, the greatest scourge of the tropics.

The virtues of cinchona bark as a remedy for malaria were first made known to Europe around 1600 from the center of Loja, Ecuador. Apparently, the Indians of the Andes had little knowledge of the properties of the tree, except possibly in the case of those living in the vicinity of Loja. *Quina*, the Spanish name of the trees and their product is derived from the Quechua name *quina-quina* of that locality. It was in 1638 that cinchona bark first attained a reputation among the Spaniards of Peru, for in that year the Countess of Chinchón, wife of the Viceroy, was cured of a tertian fever by the use of the so-called Peruvian bark. When the Countess returned to Spain in the spring of 1640, she took with her a quantity of the bark, and from this beginning its value soon became widely known in Europe, where it was for a time called *Pulvis Comitassae* (Countess' powder), under which name it was long

known to druggists. Dr. Juan de Vega, physician of the Countess, followed his patient to Spain, taking with him a quantity of quina bark, which he sold for 100 reales the pound. The Countess administered Peruvian bark to the sufferers from tertian agues on her husband's estates in the fertile but unhealthy valleys of the Tagus, Jarama, and Tajuña in Spain, so that her good deeds became traditional in the region where she lived. It was therefore quite fitting that Linnaeus dedicated to this lady the genus that yields Peruvian bark. The source of his knowledge of her work was a foreign and not a Spanish source, hence the name was published not as it should have been, *Chinchona*, but as *Cinchona*. Such a garbling of Spanish words in botanical literature of foreign countries is, unfortunately, even more frequent today, perhaps, than in Linnaeus' time!

Quinine was for more than three centuries the only drug available for the control of malaria and, consequently, was exceedingly important to people living in regions where malaria was endemic and often epidemic. At the time of World War II, the discovery of synthetics, especially atabrine (quinacrine) that would control malaria reduced reliance on quinine as the only effective antimalarial. *Cinchona* plantations that had been started in tropical America and Africa were essentially abandoned.

The story of *Cinchona* cultivation in Guatemala is well told by Dr. Popenoe in the reference given above. For a more detailed account of the history of the genus *Cinchona* see Standley, Field Mus. Bot. 7: 188-197. 1931.

Corolla 14-17 mm. long; leaves mostly firm and even coriaceous, relatively small and narrow, those of fertile branches mostly 3-4 cm. broad, glabrous or nearly so.

C. officinalis.

Corolla 10-12 mm. long; leaves thin, large, commonly 10-20 cm. broad, often or usually abundantly pubescent, at least beneath.....*C. pubescens*.

***Cinchona officinalis* L. Sp. Pl. 172. 1753. *Quina*.**

A native of the South American Andes, ranging from Colombia to Bolivia. Formerly planted extensively in the *bocacosta* of Escuintla and Suchitepéquez, in moist forests of northern Huehuetenango, in small amounts in Alta Verapaz, and probably in other departments.

A large or medium-sized tree, sometimes flowering when only a shrub, the bark rugose, fuscous, the branchlets strigillose-pilousulous; stipules large lanceolate or oblong, acute or obtuse, glabrous; leaves petiolate, comparatively small, mostly lanceolate to oblong or elliptic-oblong but varying to elliptic or ovate, acute,

acuminate, or obtuse, at the base rounded to attenuate, coriaceous, glabrous above and often lustrous, at least in the dry state, commonly glabrous beneath or nearly so but sometimes puberulent or short-pilose, especially on the veins, usually about 10 cm. long and 3.5-4 cm. broad, but leaves of sterile branches often much larger, often domatiate beneath in the nerve axils; panicles terminal, leafy, rather small and dense or sometimes large and more open; hypanthium strigose; calyx glabrous or nearly so, the teeth triangular, acute, reddish; corolla pink or red, sericeous outside, the tube about 1 cm. long, the lobes ovate, acute; capsule oblong, generally 1.5-2 cm. long, glabrate.

The form which was planted in Guatemala for exploitation is *Cinchona ledgeriana* Moens (ex Trimen, Journ. Bot. 19: 323. 1881), a native of Bolivia. This is regarded by some authors as a distinct species, and was considered the best and principal source of the drug quinine. Both the names *C. officinalis* and *C. pubescens* are used here in their broad sense, *C. ledgeriana* thus being considered a form or variety of the true *C. officinalis*.

Cinchona pubescens Vahl, Skrivt. Naturh. Selsk. 1: 19. 1790.
C. succirubra Pavón ex Klotzsch, Abh. Akad. Berl. 1857: 60. 1858.
Quina; *quin* (Quechí).

Common in fincas of the Pacific *bocacosta* and in the Cobán region of Alta Verapaz; most of the trees doubtless planted, but in many places seeding abundantly and becoming naturalized. Native of the Andes, from Colombia to Bolivia, and in Costa Rica.

A medium-sized tree, often flowering when only a large shrub, the branchlets pubescent; stipules large, ovate, obtuse or acute, sericeous or almost glabrous; leaves large, slender-petiolate, mostly broadly ovate to orbicular, rounded to acute at the apex, cordate to acute at the base and often decurrent, usually glabrate above, beneath densely short-pilose or tomentose to glabrate, often domatiate in the nerve axils; panicles usually large and many-flowered, often leafy, the flowers subsessile; hypanthium densely sericeous; calyx appressed-pilosulous, the teeth short and broad, acute; corolla red or pink, sericeous, the lobes half as long as the tube; capsule lanceolate or oblong, glabrate, commonly 1.5-2.5 cm. long.

A highly variable species as here treated, but the forms are separable by only minor characters which baffle systematic segregation. The form occurring in Guatemala (as well as in Costa Rica) is supposed to be *C. succirubra*, but in what respect, if any, that differs from typical *C. pubescens* is uncertain, to say the least.

COCCOCYPSELUM P. Browne

Prostrate perennial herbs, pubescent or sometimes glabrous; leaves opposite, petiolate, herbaceous, often purple or blue below; stipules small and inconspicuous, often with digitiform calluses in the axils; inflorescence capitate, axillary, solitary,

pedunculate or sessile; flowers small, soon falling away, white to purplish; hypanthium ovoid or turbinate; calyx 4-lobate, the lobes narrow, persistent; corolla 4-lobate, funnelform, the lobes oblong, valvate in bud, the throat glabrous; stamens 4, inserted in the corolla tube, the filaments short, the anthers dorsifixed near the base, oblong-linear, short-exserted or included; ovary 2-celled, the style short, with 2 short or somewhat elongate branches; ovules numerous, horizontal, the placentae adnate to the septum; fruit baccate, ovoid or globose, 2-celled, blue; seeds numerous, orbicular, subangulate, plano-convex, the testa granulate.

The genus *Coccocypselum* consists of perhaps some 20 species in tropical America. The genus is much in need of revision and would be a good subject for work toward a master's degree. Apparently, no generic problem is involved to complicate the study. The treatment of the Guatemalan species presented here will permit one to put useable names on plants of the genus but certainly changes may be expected when a critical study is made.

Plants glabrous throughout *C. hirsutum* var. *glabrum*.
Plants copiously pubescent.

Flowers heads sessile or nearly so; pubescence of the stems appressed.

C. herbaceum.

Flowers heads conspicuously pedunculate.

Heads many-flowered; calyx lobes somewhat obtuse *C. lanceolatum*.

Heads few-flowered; calyx lobes acute to attenuate.

Leaves appressed-pilose with short hairs on the upper surface *C. guianense*.

Leaves hirsute with spreading hairs on the upper surface.

Leaf blades mostly reniform and rounded at the apex *C. cordifolium*.

Leaf blades broadly ovate, rounded at the base, usually acute or acutish at the apex *C. hirsutum*.

Coccocypselum cordifolium Nees & Mart. Nov. Act. Nat. Cur. 12: 14. 1824. *Geophila pleuropoda* Donn.-Sm. Bot. Gaz. 52: 50. 1911 (type collected between Secanquim and Sepacuité, Alta Verapaz, G. P. Goll). *Geocardia pleuropoda* Standl. Contr. U. S. Nat. Herb. 17: 445. 1914. *Tontanea pleuropoda* Standl. N. Am. Fl. 32: 148. 1921. *Coccocypselum rothschuhii* Loesner in Engler, Bot. Jahrb. 60: 370. 1926. Figure 24.

Moist or wet, chiefly mixed, mountain forest, 1,400-2,000 m.; Alta Verapaz; Baja Verapaz; Zacapa; Chiquimula; Huehuetenango. Mexico (Veracruz) to Costa Rica; eastern and southern Brazil.

Plants creeping, the stems hirsute with long, spreading, whitish or purplish hairs; stipules filiform, 1-3 mm. long; petioles 1.5 cm. long or less, hirsute; leaf blades mostly reniform or orbicular, 1-3.5 cm. long and broad, cordate or truncate at the base, usually broadly rounded and apiculate at the apex, hirsute or hispid above with spreading hairs, often bright purple beneath and sparsely or densely long-hirsute; inflorescence capitate, mostly 2-4-flowered, the peduncles 1-3.5 cm. long, the bracts linear or foliaceous; calyx and hypanthium long-hirsute; calyx lobes linear or oblong-

linear, acute, 2-4 mm. long; corolla 12 mm. long, purplish white or sometimes blue, hirsute; fruit densely hirsute, bright blue or sometimes greenish white.

Coccocypselum guianense (Aubl.) Schum. in Mart. Fl. Bras. 6, pt. 6: 315. 1889. *Tontanea guinensis* Aubl. Pl. Guian. 108. 1775.

Guatemalan material seen only from Quiché and Chiquimula. Northern British Honduras; southern Mexico to Brazil; Jamaica and Cuba.

Stems often much elongate, pilose or hirsute with long or short, chiefly spreading hairs; stipules filiform-subulate, 2-5 mm. long; petioles 3 cm. long or less, the leaf blades oval to rounded-ovate, 2.5-7 cm. long, 1.5-4.5 cm. broad, rounded to acutish at the apex, truncate to obtuse at the base and often short-decurrent, densely pilose on the upper surface with long and short, mostly appressed hairs, often purplish beneath, densely soft-pilose; inflorescence capitate, mostly 2-4-flowered, the peduncles 1-4 cm. long, the bracts linear, 3-7 mm. long; calyx and hypanthium densely pilose, the calyx lobes linear, 3-4 mm. long; corolla blue or lavender, 7-10 mm. long, copiously pilose, the lobes half as long as the tube; fruit blue, 6-10 mm. long or larger, pilose.

There appears to be relatively little difference, and these differences small, between the plants which have been called *C. guianense* and *C. herbaceum* in our area. The quickest way to distinguish them is by the pedunculate inflorescence in *C. guianense* and the sessile inflorescence on *C. herbaceum*. There are, however, mixed collections which should be looked into for they may indicate that the two species are really not very distinct.

Coccocypselum herbaceum Lam. Encycl. 2: 56. 1786. *C. repens* Swartz, Prodr. Veg. Ind. Occ. 31. 1788. *Tontanea herbacea* Standl. N. Am. Fl. 32: 147. 1921.

Wet forests and *Manicaria* swamps, Izabal, at or near sea-level. British Honduras to Colombia and probably extending farther southward; Greater Antilles.

Procumbent or creeping, the young stems densely pilose with short or long, appressed or ascending hairs; stipules linear-subulate, 2-6 mm. long; petioles slender, 2.5 cm. long or less, the blades broadly ovate to oblong, 2-5 cm. long, 1-3 cm. broad, obtuse or subacute, rounded or obtuse at the base, sparsely or densely pilose above with short appressed hairs, short-pilose beneath, often densely so, with subappressed hairs; inflorescence capitate, all or mostly sessile, commonly 2-3-flowered, the bracts linear-subulate, 3-4 mm. long; calyx and hypanthium densely appressed pilose, the calyx lobes linear-subulate, 2-3 mm. long; corolla blue, 5-7 mm. long, short-pilose; fruit subglobose, 5-6 mm. in diameter, bright blue, short-pilose.

See comment under *C. guianense*.

Coccocypselum hirsutum Bartling ex DC. Prodr. 4: 396. 1830. *Tontanea hirsuta* Standl. N. Am. Fl. 32: 147. 1921. *Pixcac* (Alta Verapaz, probably Quecchí).

Most often in moist or wet, pine forest, 1,200-1,700 m., sometimes in mixed forest and occasionally descending to low elevations; Petén; common in the mountains of Alta Verapaz; El Progreso; Chiquimula; Sololá; Suchitepéquez; Quiché; Huehuetenango. Southern and western Mexico; British Honduras to El Salvador and Panama; southward to Trinidad and Bolivia.

Stems procumbent or creeping, densely hirsute or hispid; stipules subulate, 3-6 mm. long; petioles 2 cm. long or less, the leaf blades oval to oblong-ovate, 2-5.5 cm. long, 0.5-2 cm. broad, rounded to acutish at the apex, rounded at the base, hirsute or hispid above with long spreading yellowish hairs, hirsute beneath; inflorescence capitate, the heads 3-5-flowered, on peduncles 1-3 cm. long, the linear bracts 3-4 mm. long; calyx and hypanthium densely hirsute, the calyx lobes linear, acute, 2.5-5 mm. long; corolla lavender or pale blue, 12-14 mm. long, hirsute; fruit hirsute, 6-10 mm. long, pale to bright blue.

Like most other species of the genus, this is a handsome and, because of the abundant blue fruits, somewhat ornamental plant. The leaves often are tinged with deep purple, at least beneath. A decoction of the plant is said to be employed as a "remedy" for snake bite in Alta Verapaz.

The type specimens are presumed to have been collected in Mexico, probably by Haenke. We follow the senior author's treatment of the species in *North American Flora* knowing that he did not see the type but believe that he was correct in his understanding of the plant. The plant is quite variable. The range given here is an extensive one and there is a possibility that more than one species, or perhaps several varieties, are involved.

Coccocypselum hirsutum var. **glabrum** (Bartling ex DC.) L. Wms. Phytologia 25: 462. 1973. *C. glabrum* Bartling ex DC. Prodr. 4: 397. 1830. *Tontanea glabra* Standl. Journ. Wash. Acad. Sci. 15: 104. 1925.

A rare plant collected only in Petén and British Honduras. Nicaragua; Panama.

Glabrous plants, but otherwise similar to the typical variety described above.

The junior author assumes that the Guatemalan collection which was a mixed collection with the typical variety, is the same as the type of the plant which was collected at low elevations in Panama. The specimen from Nicaragua also was mixed with the

typical variety. It is perhaps only a minor genetic variant. *C. hirsutum* and *C. glabrum* were described in the same publication, *C. glabrum* is chosen to become the variety since *Coccocypselums* are most often pubescent.

Coccocypselum lanceolatum (Ruiz & Pavón) Pers. Syn. Pl. 1: 132. 1805. *Condalia lanceolata* Ruiz & Pavón, Fl. Peruv. 1: 54. 1798. *C. canescens* Willd. ex Cham. & Schlecht. Linnaea 4: 139. 1829. *Tontanea canescens* Standl. N. Am. Fl. 32: 146. 1921. *Manchupij* (Quecchí).

In Guatemala known only from the vicinity of Cobán, at about 1,300 m., in wet pine or mixed forests. Guatemala, Costa Rica and Panama to Bolivia and Brazil.

Plants rather stout, procumbent, the stems densely pilose-sericeous with yellowish or whitish hairs when young; stipules linear-subulate, 3-10 mm. long; petioles 2.5 cm. long or less, the blades oblong to ovate, 2-8 cm. long, 1-3.5 cm. broad, acute or obtuse, subcordate to obtuse at the base, densely pilose above with short, subappressed, mostly yellowish hairs, densely pilose beneath with longer, appressed or somewhat spreading hairs; heads densely many-flowered, on peduncles 1-6 cm. long, the bracts often large and foliaceous; calyx and hypanthium densely long-pilose, the calyx lobes oblong or ovate, 2-3 mm. long, foliaceous, usually obtuse; corolla purplish blue, about 5 mm. long, densely pilose; fruit densely pilose, 5-7 mm. long or more, bright blue or sometimes violet.

COFFEA Linnaeus. Coffee

Shrubs or small trees, usually glabrous, the branchlets subterete; stipules rather broad, persistent, acuminate; leaves opposite, membranaceous or subcoriaceous, sessile or petiolate; flowers axillary, glomerate, sessile or short-pedicellate, white, fragrant, the pedicels bracteolate, the bractlets often forming a cupule; hypanthium subcylindric to turbinate, the calyx short, truncate, dentate, or lobulate, persistent, often glandular within; corolla salverform or funnelform, the tube short or elongate, glabrous or villous in the throat, the limb 5-8-lobate, the lobes oblong, obtuse, spreading, contorted in bud; stamens usually 5, inserted in the throat of the corolla, the filaments short or none; anthers dorsifixed near the base, linear, obtuse or acute, included or exserted; ovary 2-celled, the style filiform or thickened, glabrous, the 2 branches linear or subulate; ovules solitary in the cells, affixed to the middle of the septum; fruit baccate, globose or oval, dry or fleshy, containing 2 nutlets, these coriaceous or chartaceous, convex dorsally, sulcate ventrally.

About 40 species, in tropical Asia and Africa, some of them now grown in all tropical regions of the earth.

Flowers 5-parted.....*C. arabica*.
Flowers 6-8-parted.....*C. liberica*.

Coffea arabica L. Sp. Pl. 172. 1753. *Café*; *coffee*. Figure 45.

Native of tropical Africa, now grown in most tropical regions of the earth for its seeds; planted in all Guatemalan departments except probably Totonicapán, rarely spontaneous in virgin forests.

A glabrous shrub or small tree as much as 5.5 m. tall with thin gray bark; wood white, moderately hard and fine-grained; leaves short-petiolate, oval or elliptic, 7-20 cm. long, 3-7.5 cm. broad, acuminate, cuneate at the base, subcoriaceous, usually persisting for three years, with 7-12 pairs of lateral nerves; flowers in clusters of 2-9 or more, sessile or nearly so, 12-18 mm. long; bractlets ovate, the inner ones connate at the base of the pedicel, shorter than the 5-denticulate calyx; corolla lobes equaling or exceeding the tube; anthers exserted; fruit about 1 cm. long, at first green, then red, finally blue-black.

Commercially coffee is the most important plant of Guatemala and local prosperity is dependent primarily upon the coffee crop and its market. When coffee production is good and the price is high, Guatemala, like other Central American countries, is prosperous. When its price in the world market is low, hard times prevail. Foreign credit for the purchase of essential imports is heavily dependent upon the money received from export of the coffee crop. Coffee was introduced into Guatemala around the middle of the 18th century, but its cultivation did not have more than local importance until about 1875. Coffee and bananas now make up the major portion of Guatemalan exports.

Guatemala has long been celebrated for the quality of its coffee and it is the leading Central American producer of this product. According to statistics of the Asociación Nacional del Café of Guatemala, the crop in 1970-1971 amounted to 2,800,000 hundredweight or *quintales de oro*. All of the departments produce coffee except Totonicapán where the land is too high for the production of coffee, as are the highlands of some of the other departments. The leading departments in coffee production are listed as: Escuintla, 6,256 metric tons; Santa Rosa, 12,604 metric tons; Quezaltenango, 16,468 metric tons; Suchitepéquez, 14,996 metric tons; San Marcos, 25,668 metric tons; Alta Verapaz, 6,302 metric tons. It is thus apparent that the *bocacosta* region of five western departments produced much more than half of the crop, while the Cobán region, which is sometimes assumed to produce most of the coffee of Guatemala actually produces only a small percentage of it. The yield in some of the departments is, of course, very small. The lowest producers are Petén, Izabal, and El Progreso, all of whose land is too low for commercial cultivation. Most Guatemalan coffee is grown on the lower or middle slopes of the mountains, at 600 to 1,500 m., but some is planted as high as

1,800 m., near Chimaltenango. The coffee of Antigua (1,500 m.) is noted for its excellence. Guatemalan coffee is considered a delicacy in many nations around the world; the resulting high price for the coffee has encouraged an increasing cultivation of the crop to the extent that it comprised (1972) approximately 46 per cent of Guatemalan exports with a value of \$92,000,000.

Almost all the coffee of Guatemala is grown shaded, at lower elevations for protection from the sun, at high elevations for protection from the cold. Several species of *Inga* usually are used to provide shade. Often tall forest trees are left when the land is cleared, and various kinds of fruit trees are planted in the *cafetales*. The valley of Antigua as well as the coffee-growing regions of the Chimaltenango uplands are unique in that the coffee shade consists of *Grevillea* trees, which are said to be the best protection against cold winds and fogs. At these high elevations the harvest begins January 1 or even later, when all the lowland coffee has long been gathered. In the Pacific *bocacosta*, especially at lower elevations, as well as in Alta Verapaz, bananas and plantains are much used for shade, with the production of two saleable crops on the same land. Some of the most unusual plantations are found in the higher parts of Quezaltenango, between San Martín Chile Verde and Colomba, where, at about 1,500 m., the *cafetales* are without shade and the soil consists of the loose white sand characteristic of this region.

On the Pacific slope, as well as in Alta Verapaz, much coffee is planted on the exceedingly steep slopes of *quebradas* and *barrancos*, to which it is difficult even to climb on foot. The lower and more level land of these *barrancos* usually is devoted to maize, sugar cane, and other crops. At lower elevations the coffee harvest begins soon after the rainy season, but at high elevations the coffee ripens much later. Therefore, taking the country as a whole, the some 129,000 metric tons of pure coffee that was produced in 1970-1971 was harvested throughout much of the dry season.

Traveling from one part of Guatemala to another, it is possible in almost any season to find ripe berries on the bushes. Flowers are another matter, and are seldom seen, unless one is in the proper locality on just the right day. A *cafetal* in flower is one of the most beautiful sights imaginable, accentuated by the delightful fragrance pervading the air. All the bushes burst into bloom on the same day, and in two or three days the flowers have disappeared. The date of flowering is not constant for any locality, it depends largely on rainfall. In Alta Verapaz, where there is constant moisture, the

blooming extends over several months, and the harvest likewise is prolonged, while in other regions the berries are gathered at one time.

In all the markets of Guatemala coffee is offered for sale for home consumption, and at Antigua, for instance, excellent coffee is sold quite inexpensively. Apparently, no coffee that passes through a *beneficio* is wasted, for the beans thrown out when coffee is cleaned for export are all offered for sale in the markets for a very low price. Cheap as it is, there are many Guatemalans who cannot afford the beverage, but use in its place *atol* or other drinks prepared from maize and other substances. Also, various seeds, especially those of Cassias, are used for adulterating or substituting for coffee. In times past coffee was often served in Guatemala in the form of *esencia* - essence - which was obtained by boiling the pulverized beans. The concentrated essence was then diluted by adding hot water or milk to suit the taste of the user. Today essence of coffee is rarely seen and coffee made in pots is the order of the day. Instant coffees are becoming more popular and are often served in hotels and restaurants. Where American tourists abound coffee is made to American taste and often is no better than that served in American hotels or cafes — or in homes, for that matter. Some of the best coffee anywhere is served by the National Coffee Association at the airport in Guatemala City.

Official “propaganda” for all countries from Mexico to Peru indicates that the best coffee in the world comes from the country being propagandized — and this may be true. The junior author, having been Consul of Guatemala in Chicago for many years, is quite sure that no coffee quite compares in flavor or aroma to that of Guatemala!

The names coffee and café are both derivatives of the Arabic word, kahweh, signifying wine. Coffee is a vegetable product of relatively recent introduction into the civilized world. It is believed that it reached Arabia from Africa during the fourteenth century, and did not attain common use in Europe until around the middle of the seventeenth century. It did not become a common crop in Central America until after the middle of the nineteenth century.

Coffea liberica Bull, Retail List New, Beautif. and Rare Pl. No. 97: 4. 1874. *Café robusta; Liberian coffee.*

Native of Liberia and adjacent regions of West Africa; cultivated on a small scale in Guatemala.

A glabrous shrub or tree, sometimes 10 m. high but usually much lower, at least in cultivation; leaves short-petiolate, coriaceous, lustrous, mostly elliptic-obovate, 12-30 cm. long, 5-12 cm. broad, short-acuminate, acute or obtuse at the base, the lateral nerves 8-12 pairs, domatiate in their axils; flowers several in a cluster, subsessile, 2.5 cm. long; bractlets connate, shorter than the subtruncate calyx; corolla lobes about as long as the tube; anthers exserted; fruit 2-2.5 cm. long or even larger, yellowish red, turning black.

This species is said to be planted in various regions of Guatemala, but is little esteemed. We have noted but one plantation of any size, in Retalhuleu near Chivolandia, but there are said to be others in the Pacific *bocacosta* and in Alta Verapaz. In its habit of growth *Coffea liberica* differs noticeably from *C. arabica*. The leaves are twice as large and rather handsome. Flowering is continued through much of the year and the berries hang upon the bushes for a long time (in *C. arabica* they soon fall if not picked). Liberian coffee is said to produce better at lower elevations than *C. arabica*, and to be less susceptible to fungus diseases. However, it never has become popular in American countries.

It is worthy of note that in Guatemala *Coffea liberica* is known among even the laborers as *Café robusta*, but it is not *Coffea robusta* Linden of tropical Africa, which often is known as "robusta coffee."

Coffea excelsa A. Chev. Rev. Cult. Col. 12: 258. 1903.

Shrubs said to be of this species were seen growing in the grounds of the Dirección de Agricultura in Guatemala years ago. It is an African species that produces low-grade coffee, and is cultivated in some regions of Africa.

Coffea corymbulosa Bertol. Fl. Guat. 410. 1840.

This was based upon material collected by Velásquez at some unspecified locality in Guatemala. Bertoloni states that "*Coffea arabica* differs from this in its acuminate leaves and subsessile flowers." It is suspected that the plant so named may be merely *Coffea arabica*, but it may be a representative of some different genus. This cannot be determined without examination of the type specimen, in the Bertoloni herbarium in Italy.

COSMIBUENA Ruiz & Pavón

Erect or scandent, sometimes epiphytic shrubs or trees; leaves opposite, petiolate, coriaceous or fleshy; stipules large, interpetiolar, soon deciduous; inflorescence terminal, 1-flowered or a 3-flowered cyme (ours), sometimes paniculate; flowers large, white; hypanthium oblong or turbinate; calyx tubular or campanulate, 5-6-dentate, deciduous, the lobes sometimes unequal; corolla salverform or funnelform, the tube elongate, slightly expanded at the throat, 5-6-lobate, the lobes spreading, contorted; stamens as many as the corolla lobes, inserted below the throat; stamens included, the anthers linear, basifixed, filaments short; ovary 2-celled; style elongate, clavate, bifid; ovules many; capsule oblong or ovate, coriaceous, 2-celled, septicidally bivalvate from the apex; seeds many, oblong, produced into a wing (often or always bifid) at the ends.

A small genus of about a dozen species, mostly South American, two others in southern Central America.

Cosmibuena matudae (Standl.) L. Wms. Fieldiana, Bot. 31: 45. 1965. *Hillia matudae* Standl. Field Mus. Bot. 22: 51. 1940 (type from Volcán de Tacaná, Chiapas, *Matuda* 2327). *Cosmibuena holdridgei* Monachino, Phytologia 3: 64. 1949 (type *Holdridge s.n.* near Barillas, Huehuetenango). Figure 15.

Moist or wet mountain forests, 500-1,800 m.; Alta Verapaz; Huehuetenango; Chiquimula; and doubtless in other western departments. Mexico (Chiapas); Honduras; Nicaragua.

A tree of 20 m. or less, also epiphytic; stipules broadly elliptic, 2 cm. long, very obtuse, 12 mm. broad, caducous; petioles 1.5-2.5 cm. long, the blades broadly elliptic or oval-elliptic, 6.5-10.5 cm. long, 4-8 cm. broad, obtuse, shortly cuneate-narrowed at the base; flowers fragrant, solitary or in three's at the apex of the branch, on short stout pedicels; hypanthium clavate, 7-8 mm. long, narrowed to the base; calyx 9 mm. long or less, the segments lanceolate, subulate-acuminate, erect, rigid, unequal; corolla white, coriaceous, the slender tube 9 cm. long, 4 mm. broad at the middle, 6 mm. broad in the throat, the 5 lobes spreading, oblong, obtuse or rounded at the apex, 3-3.5 cm. long.

COUSSAREA Aublet

Shrubs or small trees, usually glabrous; stipules commonly ovate-deltoid, muticous, apiculate, or truncate, never subulate-aristate or connate into a long sheath; leaves opposite or rarely verticillate, short-petiolate or sessile, more or less coriaceous; inflorescence terminal, usually paniculate, but variable in form; hypanthium ovoid or turbinate, the calyx cupular and truncate, sometimes 4-dentate or rarely 4-lobate; corolla funnelform or salverform, the throat dilated, naked within, the 4 lobes valvate in bud, oblong or sometimes elongate; anthers subsessile in the corolla tube, dorsifixed near the base, included or exserted; ovary 1-celled, or rarely 2-celled but with a very thin septum; the style filiform, with 2 short branches; ovules erect, inserted on a very short basal column; fruit drupaceous, by abortion commonly 1-seeded, coriaceous, ovoid or oval, longer than broad, small or rather large; seed erect.

A large number of species are known from South America, one from Mexico, and about a dozen others from Central America and Panama. The genus *Dukea* Dwyer, from Panama, is hardly distinct.

Leaves sessile or nearly so; corolla minutely puberulent.....*C. imitans*.
 Leaves slender-petiolate; corolla glabrous.....*C. mediocris*.

Coussarea imitans L. Wms. Phytologia 26: 488, *fig.* 1973.
 Figure 54.

Wet mixed forests at about 150 m., Petén; Izabal (type, *Steyermark 39013*); British Honduras.

Small trees 8-12 m. tall and to 10 cm. in diameter, the branchlets glabrous, terete or nearly so; leaves broadly elliptic or ovate-elliptic, short acuminate, subsessile, cuneate and abruptly terminated at the base, glabrous, the blades 12-20 cm. long and 3.5-9 cm. broad, acuminate tip about 1 cm. long, lateral veins mostly 8-10 pairs, prominulous, petiole 2-5 mm. long; inflorescences terminal, thyrsoid-paniculate, short pedunculate and surpassed by the subtending leaves, to about 8 cm. long, sparsely to densely puberulent above; flowers 25-28 mm. long when mature; calyx and hypanthium densely pubescent, about 3 mm. long, the calyx subcampanulate, about 1.5 mm. long and 2 mm. broad, bidentate or obscurely 4-dentate; corolla white, fragrant, densely and minutely puberulent outside, 25-28 mm. long, the tube narrow, about 18 mm. long, the lobes linear-oblong, acute, 8-9 mm. long; anthers linear, about 8 mm. long, inserted below, filaments attached near the base of anthers, about 1 mm. long; style bifid, shorter than or as long as the corolla tube; fruits indehiscent, subbaccate, laterally compressed, obovate, 1.5-2 cm. long and 1.2-1.5 cm. broad, 1-seeded, the calyx persistent.

Confused with *Coussarea impetiolearis* Donn.-Sm., a Costa Rican species, also with nearly sessile leaves.

Coussarea mediocris Standl. & Steyer. Field Mus. Bot. 23: 248. 1947.

Known only from the type, Huehuetenango, forested ravine near Maxbal, about 17 miles north of Barillas, Sierra de los Cuchumatanes, 1,500 m., *Steyermark 48732*.

A small tree of 6-7.5 m., the branches terete, glabrous or obscurely puberulent; stipules 3 mm. high, very broad, intrapetiolar, connate, very shallowly bilobate at the apex; leaves firm-membranaceous, somewhat lustrous, on slender petioles 1.5-2 cm. long, elliptic-oblong or lance-oblong, 9-14.5 cm. long, 3.5-4.5 cm. broad, rather abruptly long-acuminate, acute at the base, glabrous, the lateral nerves about 6 pairs, arcuate-ascending, the veins prominulous and laxly reticulate; inflorescence terminal, cymose-paniculate, on stout peduncles 1.5-3 cm. long, 3-4 cm. long and broad, trichotomous at the base, the branches terete, glabrous, the flowers sessile, densely aggregate at the ends of the branches; hypanthium glabrous, campanulate, almost 1.5 mm. high, obtuse at the base; calyx barely 0.5 mm. high, obscurely undulate-dentate; corolla white, 2.5 mm. long, glabrous outside, the tube 2 mm. broad at the base, then

slightly narrowed, then slightly dilated upward, 3 mm. broad at the apex, the lobes linear-oblong, 7-8 mm. long, obtuse; anthers subexserted, linear, acute, 4 mm. long.

The junior author thinks that it is quite possible that the plant is a *Psychotria*.

COUTAREA Aublet

Shrubs or small trees with terete branchlets; stipules interpetiolar, short, acute; leaves opposite, petiolate, herbaceous; flowers large, terminal and axillary, solitary or in few-flowered cymes, pedicellate; hypanthium turbinate, the calyx 6-lobate, the lobes narrow, deciduous, subequal; corolla funnelform-campanulate, conspicuously asymmetric, the tube slightly curved and gibbous-ventricose, the throat glabrous, the limb 6-lobate, the lobes contorted in bud, one of them exterior; stamens 6, inserted at the base of the corolla, the filaments filiform, much contorted; anthers basifixed, linear, exserted; ovary 2-celled, the style filiform, the stigma clavellate-subulate, exserted; ovules numerous, horizontal, the placentae affixed to the septum; capsule large, obcompressed, coriaceous or ligneous, 2-celled, loculicidally bivalvate; seeds numerous, imbricate, broadly winged.

In North America only one species is known, but probably several species occur in South America.

Coutarea hexandra (Jacq.) Schum. in Mart. Fl. Bras. 6, pt. 6: 196. 1889. *Portlandia hexandra* Jacq. Enum. Pl. Carib. 16. 1760. *C. speciosa* Aubl. Pl. Guian. 314, t. 122. 1775. *Quina*. Figure 19.

Brushy plains and hillsides, 850 m. or lower; probably in Petén; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sololá; probably in all the Pacific coast departments. Mexico (Chiapas); British Honduras to Panama; southward to Peru and Argentina.

A shrub or small tree, usually almost glabrous (in Central America), the branchlets whitish-lenticellate; stipules deltoid, 2-4 mm. long, acute and mucronate; petioles slender, about 1 cm. long or less, the blades ovate or oval, 5-12 cm. long, 2-6 cm. broad, cuspidate-acuminate to acute, rounded to acute at the base; flowers mostly in 3-flowered, terminal and axillary cymes, sometimes solitary, short-pedicellate; hypanthium 4-6 mm. long; calyx lobes 6, lance-subulate or linear-subulate, 5-12 mm. long; corolla white or yellowish, tinged below with purple, the tube gibbous, 1-2 cm. broad in the throat, the lobes ovate, acute or obtuse, about one-third as long as the tube or shorter, the whole corolla about 6 cm. long; stamens usually exceeding the corolla lobes, the yellow anthers 1.5-2 cm. long; capsule oblong-obovoid or oval-obovoid, about 2 cm. broad, shallowly bisulcate, dark brown, whitish-lenticellate; seeds oval or orbicular, 8-10 mm. long, brown.

The leaves and branches are intensely bitter. Chiefly on this account, perhaps, the plant is used in Guatemala and other parts of Central America as a domestic remedy for malaria. Known in El Salvador also by the names "quinita," "quina blanca," and "zalas"

or "salas." The bark is employed extensively there as a remedy for fevers and a decoction of it, called agua de quina, is employed in the treatment of wounds and sores.

CRUSEA Chamisso & Schlechtendal

Reference: Anderson, William R., A monograph of the genus *Crusea*, Mem. N. Y. Bot. Gard. 22 (4): 1-128, *illus.* 1972.

Annual or perennial herbs, erect or procumbent, glabrous or variously pubescent, the stems 4-angulate; stipules connate with the petioles to form a ciliate sheath, persistent; leaves opposite, ovate to linear, often conspicuously nerved; flowers small or medium-sized, usually pink or purple, capitate, the heads commonly subtended by 4 foliaceous bracts; hypanthium ovoid or obovoid, compressed; calyx lobes 4, persistent, elongate-subulate, sometimes alternating with small teeth; corolla funnellform, with a slender tube, the throat glabrous, the lobes of the limb 4, spreading, oblong or lanceolate, valvate in bud; stamens 4, inserted in the mouth of the corolla tube, the filaments elongate, filiform; anthers dorsifixed above the base, linear-oblong, long-exserted; ovary 2-celled, the style capillary, the stigma simple or of 2 short branches; ovules solitary in the cells, attached at the middle of the septum; capsule didymous, 2-coccous, the cocci indehiscent, separating from the persistent axis.

The group consists of 13 species, in Central America, Mexico, and southwestern United States. The illustrations in Dr. Anderson's monograph are very good, the descriptions are not easy to follow.

Stems glabrous or puberulent or very sparsely hirsute.

Corolla 2-2.5 cm. long; leaves ovate or ovate-lanceolate.....*C. coccinea*.

Corolla less than 1 cm. long.

Leaves linear to subulate; plants to 30 cm. tall.....*C. diversifolia*.

Leaves narrowly elliptic to ovate; plants mostly much more than 30 cm. tall.

C. setosa.

Stems densely hirsute, hispid, or spreading-pilose, at least on the peduncles.

Corolla tube scarcely exceeding the calyx lobes.....*C. parviflora*.

Corolla tube much longer than the calyx lobes.

Calyx lobes lanceolate, about 1.5 mm. long; bracts subtending the flower heads ovate or lance-ovate, 1-3 cm. long; plants annual and usually erect.

C. longiflora.

Calyx lobes linear-subulate, elongate; bracts subtending the flower heads ovate to narrowly lanceolate, mostly 3 cm. long or more; plants chiefly perennial and often procumbent.

Bracts at the base of the flower heads chiefly ovate, conspicuously contracted and petiolate at the base.....*C. hispida*.

Bracts at the base of the flower heads chiefly lanceolate or narrowly lanceolate, scarcely petiolate.....*C. calocephala*.

Crusea calocephala DC. Prodr. 4: 567. 1830. *C. elata* Brandegee, Univ. Cal. Publ. Bot. 6: 68. 1914. *C. guatemalensis* Gandoger, Bull. Soc. Bot. France 65: 34. 1918 (type, *Tuerckheim*

from Alta Verapaz). *Verbena silvestre*; *heliotropio silvestre*; *hierba de pato* (fide Aguilar); *chuchúm* (Cobán, Quecchí). Figure 61.

Common and widely distributed over much of Guatemala, at 2,500 m. or lower, chiefly in pine-oak forest, often in thickets or on roadside banks, or even a weed in cornfields; Petén; Alta Verapaz; El Progreso; Izabal; Chiquimula; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Chimaltenango; Sololá; Suchitepéquez; Quiché; Huehuetenango; San Marcos. Mexico; British Honduras; El Salvador; Honduras.

Plants annual or apparently often perennial, copiously branched, erect or more often procumbent and forming large mats of stems, these densely hirsute with long spreading whitish hairs; leaves lanceolate or oblong-lanceolate, mostly 3-6 cm. long, acute, conspicuously nerved, with very oblique nerves, hirsute on both surfaces; inflorescence long-pedunculate, densely many-flowered, capitate, in fruit 2 cm. broad or more, subtended at the base by usually 4 large bracts similar to the leaves; calyx densely long-hirsute, the lobes subulate from a short triangular base; corolla purple or rose-purple, 12-15 mm. long, the very slender tube minutely puberulent; cocci smooth, brown, about 2 mm. long, glabrous.

The plant is a showy one and rather handsome until the flowers and foliage begin to wither. In Guatemala it is far more abundant than any other representative of the genus. The nomenclature of the species is somewhat uncertain. It was based upon one of the Sessé and Mociño drawings of Mexican plants which agrees none too well with the material generally referred to *C. calocephala*.

Crusea coccinea DC. Prodr. 4: 567. 1830. *C. coccinea* var. *breviloba* Loes. Bot. Verh. Brandenb. 65: 115. 1923 (type collected near San Martín, Jacaltenango, Huehuetenango, *Seler 3113*). *Sanalotodo* (Huehuetenango).

Rocky slopes or in pine or mixed forest in the mountains, 1,000-2,000 m.; Zacapa; Chiquimula; Suchitepéquez; Sololá; Huehuetenango; Quezaltenango. Southern Mexico to Panama.

Plants branched, perennial, procumbent, glabrous throughout or nearly so, the stems obtusely tetragonous; setae of the stipules filiform, elongate, glandular-thickened at the apex; leaves evidently petiolate, mostly ovate and 3-5 cm. long, acuminate or long-acuminate, scarcely paler beneath, conspicuously nerved, with very oblique nerves; flowers heads long-pedunculate, dense but often with only few flowers, subtended by 2 or 4 large bracts similar to the leaves; calyx lobes triangular-lanceolate, ciliate; corolla lilac, about 2.5 cm. long, the throat dilated and much broader than in other species, the broad lobes hispidulous outside; cocci smooth, glabrous.

In Huehuetenango a decoction of the plant is applied externally in treatment of cuts and skin afflictions.

Var. *breviloba* is described as having the flowers somewhat smaller than in the typical form, with shorter corolla lobes, the tube somewhat puberulent outside; it is known from Suchitepéquez, Sololá, and Huehuetenango.

Crusea diversifolia (HBK.) W. R. Anderson, Mem. N. Y. Bot. Gard. 22(4): 58. 1972. *Spermacoce diversifolia* HBK. Nov. Gen. & Sp. 3: 341. 1819. *Borreria subulata* DC. Prodr. 4: 543. 1830. *Spermacoce subulata* Hemsl. Biol. Cent. Am. Bot. 2: 60. 1881. *Diodia subulata* Standl. Field Mus. Bot. 8: 386. 1931.

Open slopes in pine or oak forests in the western and central highlands, 1,400-2,500 m.; Guatemala; Huehuetenango. New Mexico and Arizona; widely distributed in the Mexican highlands.

Simple or diffusely branched annuals to 30 cm. tall; stems 4-angulate, glabrous or sparsely pilosulose; leaves linear or linear-elliptic to subulate, hispidulous, acute, mostly 7-20 mm. long and 1-3 mm. broad; stipular sheath 1-3 mm. long bearing mostly 3-5 setae; inflorescences of terminal or lateral bracteate short-pedunculate heads with 3-many flowers; hypanthium glabrous to scabrous, 1-1.5 mm. long; calyx 1.5-4 mm. long, the tube short, to 0.8 mm. long, the triangular to subulate lobes to 3.5 mm. long; corolla mostly 3-6 mm. long, the tube to about 4 mm. long, the triangular lobes to about 2 mm. long; seeds to about 2 mm. long, setulose.

The species resembles a *Diodia* to which it has been referred in recent years.

Crusea hispida (Mill.) Robinson, Proc. Am. Acad. 45: 409. 1910. *Crucianella hispida* Mill. Gard. Dict. ed. 8. No. 4. 1768. *Spermacoce rubra* Jacq. Hort. Schoenbr. 3: 3, t. 256. 1798. *Crusea rubra* Schlecht. & Cham. Linnaea 5: 165. 1830.

Brushy slopes or plains, 300-870 m.; Chiquimula (above El Rincón); Escuintla; Suchitepéquez (near Santo Domingo); Huehuetenango. Southern Mexico; El Salvador.

Plants annual, erect, the stems obtusely tetragonous, hirsute or hispid with whitish, usually somewhat recurved hairs, simple or branched; setae of the stipules slender and elongate, hispid; leaves on short or often elongate petioles, chiefly ovate or lance-ovate, hirsute, 3.5-5(-8) cm. long, subobtuse to acuminate, thin, almost concolorous, inconspicuously nerved; inflorescence capitate, terminal and axillary, on long or short peduncles, rather laxly few-flowered, subtended at the base by usually 2 large bracts similar to the leaves and by numerous smaller but similar foliaceous bracts; calyx lobes linear, green, elongate, coarsely hispid, 2-6 mm. long; corolla rose-purple, about 6 mm. long, the very slender tube minutely puberulent, the anthers long-exserted; cocci glabrous, smooth.

Crusea longiflora (Willd. ex Roem. & Schult.) W. R. Anderson, Mem. N. Y. Bot. Gard. 22(4): 89. 1972. *Spermacoce longiflora* Willd. ex R. & S. Syst. Veg. 3: 531. 1818. *Crusea brachyphylla* Cham. & Schlecht. Linnaea 5: 165. 1830.

Of scattered occurrence, on grassy slopes or in pine and oak forest, 500-2,500 m.; Chiquimula; Jalapa; Santa Rosa; Guatemala; Chimaltenango; Huehuetenango. Mexico; Honduras and Costa Rica.

Plants annual, erect, usually branched, generally 30 cm. high or less, the stems terete, pilose or hirsute with rather soft, white hairs; leaves chiefly ovate or oblong-ovate, and 1.5-5 cm. long, acute, hirsute on both surfaces, much paler beneath; inflorescence capitate, the heads very dense and many-flowered, in fruit about 1.5 cm. broad, the subtending bracts similar to the leaves and of about the same size, pale at the base; calyx lobes smaller and relatively broader than in other species, 1-3.5 mm. long, very densely covered with long soft white hairs; corolla white or purplish white, the slender tube densely and minutely pilosulous, 6-11 mm. long; cocci minutely papillate-roughened.

Crusea parviflora Hook. & Arn. Bot. Beech. Voy. 430, t. 99. 1840. *Hierba de pájaro* (fide Aguilar).

Dry or moist thickets or on rocky banks, 1,500 m. or lower; Santa Rosa; Escuintla; Guatemala; Sacatepéquez. Mexico; ranging southward to Costa Rica.

Annual, erect or spreading, 80 cm. high or less, often much branched, the stems obtusely tetragonous, short-pilose below or finally glabrate, more densely pilose above with longer hairs; setae of the stipules short, appressed-pilose; leaves thin, inconspicuously nerved, mostly ovate and 2-4 cm. long, acute, densely pilose, short-petiolate; inflorescence capitate, the heads in fruit about 12 mm. broad, densely many-flowered, subtended by 4 small ovate bracts similar to the leaves; calyx lobes linear-spatulate, acute, long-ciliate, 1-2.5 mm. long; corolla white, pubescent, scarcely exceeding the calyx lobes, pubescent; cocci subglobose, glabrous, punctate.

Crusea setosa (Mart. & Gal.) Standl. & Steyerl. Field Mus. Bot. 23: 22. 1943. *Borreria setosa* Mart. & Gal. Bull. Acad. Brux. 11, pt. 1: 131. 1844. *Spermacoce setosa* Hemsl. Biol. Cent.-Am. Bot. 2: 60. 1881. *C. cruciata* Wats. Proc. Am. Acad. 25: 152. 1890. *B. chiapensis* Brandegee, Univ. Cal. Publ. Bot. 10: 417. 1924. *Estrella*.

Open, often gravelly or rocky slopes, sometimes in oak forest, 1,800 m. or lower; Alta Verapaz; Jalapa; Jutiapa; Guatemala; Huehuetenango. Mexico.

A slender or stout, erect annual, the stems glabrous or nearly so, obtusely tetragonous, the sheaths hispidulous; leaves linear-lanceolate, attenuate, often somewhat revolute, green and scabrous above, hispidulous or scabrous beneath on the

very conspicuous nerves, paler beneath; inflorescence capitate, the heads dense and many-flowered, long-pedunculate, subtended by 4 long bracts similar to the leaves; calyx densely white-hirsute, the green lobes lance-subulate, short; corolla about 5 mm. long, lilac, glabrous; cocci 2 mm. long or more, minutely tuberculate.

DECLIEUXIA Humboldt, Bonpland & Kunth

Herbs or low shrubs, branched, glabrous or scaberulous, the branches terete or angulate; stipules reduced to a line bearing 1-3 rigid setae; leaves opposite or verticillate, sessile or short-petiolate, coriaceous; flowers small, in terminal cymes having more or less scorpioid branches; hypanthium orbicular or obovoid, compressed; calyx lobes 2 or 4, equal or unequal, persistent; corolla funnelform, pilose or villous in the throat, the 4 lobes short, spreading or reflexed, valvate in bud; stamens 4, inserted in the corolla throat, the filaments filiform, the anthers dorsifixed, versatile, oblong, obtuse, partly or wholly exserted; ovary 2-celled, the style filiform, with 2 short branches; ovules solitary, erect; fruit dry, laterally compressed, didymous, the lobes orbicular, indehiscent.

A genus of tropical America with numerous species in South America, mostly in Brazil, a single one occurring in Mexico and Central America.

Declieuxia fruticosa (Willd.) Kuntze, var. **mexicana** (DC.) Standl. Field Mus. Bot. 12: 378. 1936. *Declieuxia mexicana* DC. Prodr. 4: 479. 1830. Figure 51.

Moist open pine forest, 1,000-2,000 m.; Zacapa; Huehuetenango; reported by Hemsley as collected between Toco and San Jerónimo (Baja Verapaz?), *Bernoulli 1011*. Southern Mexico; savannas and grassy pine ridges of northern British Honduras and doubtless extending into Petén; ranging southward to Panama and widely distributed in South America (the species; not the variety). Uncommon in Guatemala.

Plants herbaceous or suffrutescent from a hard woody root, usually with several simple or branched stems 30 cm. high or less, glabrous throughout or nearly so, the stems somewhat angulate; leaves opposite, sessile or almost so, lance-oblong to linear-oblong, mostly 2-3 cm. long, acute or subobtuse, narrowed to the subacute base, lustrous above; cymes small and few-flowered, pedunculate, with conspicuous but small, linear, persistent, spreading bracts; corolla white, 5-6 mm. long, lustrous.

The plant elsewhere in Central America grows principally in grassy savannas. The form of Mexico and Central America differs but little if at all from the typical one of Colombia and Venezuela.

DEPPEA Schlechtendal & Chamisso

Slender shrubs, more or less pubescent; stipules small, interpetiolar, deciduous; leaves opposite, petiolate, membranaceous, often anisophyllous; flowers small, yellow, arranged in axillary or terminal cymes or umbels, sometimes solitary in the leaf axils, pedicellate; hypanthium turbinate or hemispheric; calyx 4-lobate, the lobes equal or unequal, persistent; corolla rotate or short-funnelform, the throat glabrous, the limb 4-lobate, the lobes spreading in anthesis, contorted in bud; stamens 4, inserted in the corolla throat, the filaments short, linear, compressed; anthers exerted, dorsifixed, oblong or linear; ovary 2-celled, the style slender, the stigma capitate or bilobate; ovules numerous, imbricate, the placentae peltately affixed to the septum; capsule small, turbinate or obovoid, coriaceous or chartaceous, costate, 2-celled, loculicidal from the apex, the valves cleft; seeds numerous, minute, subglobose, obtusely angulate, the testa granulate.

About 20 species are known, in the forests of Mexico and Central America.

Capsule oval or ovoid, rounded at the base, very inconspicuously costate.

Calyx lobes very unequal, the larger ones lanceolate or oblong, foliaceous, and 3-8 mm. long *D. inaequalis*.

Calyx lobes subequal, all very small and less than 2 mm. long.

Leaves rounded or very obtuse at the apex, mostly 6-8 cm. broad or broader; calyx lobes linear-subulate, 2 mm. long *D. amaranthina*.

Leaves acute or acuminate, mostly 2-3 cm. broad; calyx lobes minute, deltoid.

..... *D. pubescens*.

Capsule turbinate, acute at the base, very conspicuously costate.

Corolla 6-9 mm. long; flowers in small or large cymes *D. grandiflora*.

Corollas 2.5-4 mm. long; flowers in secund racemes.

Young branches and inflorescences pilosulose; corollas 2.5-3 mm. long; underleaf surface not lineolate *D. anisophylla*.

Young branches and inflorescences glabrous; corolla 3-3.5 mm. long; underleaf surface lineolate *D. flava*.

Deppea amaranthina Standl. & Steyerl. Field Mus. Bot. 22: 281. 1940.

Known only from the fruiting type, rocky wooded slopes along river, Chiquimula, Cerro Brujo, near village of Brujo, 1,500-2,000 m., *Steyermark* 30926.

A branched shrub, the young branchlets hirtellous-villosulous; leaves large, the petioles 1-3.5 cm. long, the blades rounded-ovate or rhombic-ovate, sometimes almost orbicular, 7-11 cm. long, 4-8 cm. broad, rounded or obtuse at the apex, rounded to broadly cuneate at the base and abruptly decurrent, sparsely and minutely villosulous above, slightly paler beneath and more densely villosulous; inflorescence cymose-paniculate, the panicles lax and few-flowered, 4 cm. long or less, usually shorter than the petioles, the slender pedicels 3-6 mm. long; sepals reflexed in fruit, linear-subulate, 2 mm. long; capsule oval, 5 mm. long, 3 mm. broad, obtuse at the base, obscurely costate, sparsely puberulent or almost glabrous.

Deppea anisophylla L. Wms., *Phytologia* 26: 490. 1973.

In mountain forest, 1,000-1,300 m., Suchitepéquez (type from Finca Moca, *Skutch* 2072).

Slender shrubs to 1.5 m. tall, the young branches short pilose pubescent, becoming glabrous with age; leaves prominently anisophyllous, the large leaf of a pair 2-4 times larger than the opposite leaf, elliptic to lanceolate, acuminate, the blade (large) 6-10 cm. long, 1.5-3 cm. broad, sparsely short pilose especially along the veins below, the petiole up to about 2 cm. long, sparsely short pilose; inflorescences few-several-flowered secund racemes, mostly about 1.5-3 cm. long, the peduncle extremely slender, puberulent; hypanthium about 1 mm. long, subglabrous; the calyx divided to the base, the lobes somewhat unequal, the longest lobe about 1 mm. long, linear, ciliate or not; corolla rotate, divided almost to the base, about 2.5-3 mm. long, the 4 lobes lanceolate, acute, sparsely pilose dorsally, about 2.2-2.5 mm. long and to 1 mm. broad; anthers linear-oblong, obtuse, about 1.5 mm. long, the filaments very short; style about 2.5 mm. long, stigmas globose; capsules narrowly obovate, strongly reticulate, 2.5-3.5 mm. long.

The smallest flowered of the Guatemalan species and the only one with pubescence in the inflorescence and on young stems. The very unequal leaves in each pair are distinctive.

Deppea flava (Brandeggee) L. Wms. *comb. nov.* *Plocaniophyllon flavum* Brandeggee, Univ. Cal. Publ. Bot. 6: 69. 1914; Standley, N. Am. Fl. 32: 139. 1921. Figure 7.

In dense mixed forests or wet thickets, 750-1,500 m.; Quezaltenango; San Marcos. Mexico (type from Finca Mexiquito, Chiapas, *Purpus* 7019).

A slender shrub 1-3 m. tall, the branchlets slender, glabrous; leaves anisophyllous, one of a pair often twice as large as the other, elliptic or lanceolate, acuminate, the larger ones 6-12 cm. long and 1.5-3.5 cm. broad, tertiary veins on lower surface prominent and lineolate, petioles slender, up to 1 cm. long; inflorescences axillary, few-several-flowered secund racemes, often almost equaling the leaves, the peduncles filiform, 3-5 cm. long; calyx and hypanthium about 2 mm. long at anthesis, the lobes subequal or somewhat unequal, about 0.5 mm. long, triangular-lanceolate; corolla yellowish, about 3-3.5 mm. long, the tube very short, the lobes oblong, acute; capsule cylindric, acute at the base, 5-8 mm. long.

The genus *Plocaniophyllum* seems to differ in no substantial way from *Deppea*. The senior author, in *North American Flora* (32: 139. 1921), placed the plant in the tribe Mussaendeae because of the lineolate underleaf surface, the fruits being unknown. It is clear now that the plant belongs in the tribe Rondeletieae and that the lineolate condition is not sufficient for generic distinction.

Deppea grandiflora Schlecht. *Linnaea* 19: 748. 1847. *D. floribunda* Hemsl. *Diag. Pl. Mex.* 31. 1879. Figure 8.

Damp mixed forest or on brushy slopes, 1,200-3,000 m.; El Progreso; Santa Rosa; Huehuetenango; Quezaltenango; San Marcos. Southern Mexico to Panama.

A shrub 1-2 m. high, rarely a tree of 6 m., the branches brownish, puberulent when young; petioles 1-4 cm. long, the blades oblanceolate to ovate or ovate-oblong, 5-15 cm. long, 1.5-6.5 cm. broad, abruptly acuminate to attenuate at the apex, acute to attenuate at the base, glabrous or sparsely puberulent above, puberulent or villosulous beneath, especially along the veins; inflorescence cymose-corymbose, usually many-flowered, long-pedunculate, the puberulent pedicels 1-6 mm. long; hypanthium broadly turbinate, glabrous or obscurely puberulent; calyx lobes minute, deltoid, acute; corolla glabrous, lemon-yellow, 6-10 mm. long, obtuse or acute in bud, the tube very short, the lobes oblong or ovate, obtuse; anthers 2.5-3 mm. long; capsule turbinate, 3-5 mm. long, prominently 8-costate, coriaceous, dark brown; seeds minute, dark brown.

The species as treated here is in the broad sense and as it is in the herbarium there is certainly more than one species involved. It is quite probable that *D. costaricensis* Polak. is distinct and probably extends northward to Honduras.

Deppea inaequalis Standl. & Steyerl. Field Mus. Bot. 22: 384. 1940.

Type from San Marcos, above Finca El Porvenir, along Río Cabús to within two miles of Cueva de las Palomas, southern slopes of Volcán de Tajumulco, 1,300-1,500 m., *Steyermark* 37974; also no. 37947. Mexico.

A branched shrub 1-1.5 m. high, the young branchlets minutely puberulent; petioles short, 12 mm. long or much shorter, the blades ovate-lanceolate to narrowly lanceolate or elliptic-lanceolate, 5-12 cm. long, 2-4 cm. broad, long-acuminate, toward the base subabruptly contracted and narrowly long-attenuate, sparsely short-pilose above, sparsely and minutely puberulent beneath or almost glabrous; flowers cymose, the cymes lax, few-flowered, sometimes umbelliform, the peduncles 5 cm. long or shorter, usually 1-2 cm. long, the pedicels up to 8 mm. long, minutely and sparsely puberulent; hypanthium broadly obovoid, 1 mm. long, minutely puberulent or almost glabrous; calyx lobes very unequal, green, one of them much smaller and only 1-2 mm. long, the other 3 mostly 4-7 mm. long, linear or lanceolate, almost glabrous; corolla acute in bud, sparsely and minutely puberulent, about 4 mm. long in anthesis; anthers oblong, 2.3 mm. long; immature capsule oval, 3 mm. long.

Deppea pubescens Hemsl. Diag. Pl. Mex. 31. 1879.

Chiquimula (forested slopes, Volcán de Ipala, 1,510 m.); Quezaltenango (between Santa María de Jesús and Calahuaché, 1,200-1,300 m.). Southern Mexico.

A slender shrub 1-1.5 m. tall, the branchlets densely villosulous when young, brown; petioles 0.5-2 cm. long, the blades ovate or lance-oblong, 3.5-7.5 cm. long, 1.2-3

cm. broad, acute or acuminate, acute at the base, puberulent above, densely villousulous or tomentose beneath; inflorescence cymose-corymbose, few-flowered, sometimes equaling the leaves but usually much shorter, slender-pedunculate, the pedicels 2-5 mm. long; hypanthium 0.8 mm. long, puberulent; calyx lobes ovate-deltoid, obtuse; corolla 2-3 mm. long, almost rotate, glabrous; capsule oval, about 3 mm. long, puberulent, very obscurely costate.

Another species may be involved. The Guatemalan material is not good.

DIDYMAEA Hooker f.

Perennial herbs, procumbent or scandent, in habit similar to *Galium*, usually much branched, glabrous to densely pubescent (rarely), with brittle stems; leaves opposite, petiolate, herbaceous; stipules interpetiolar, geminate or a single bifid stipule on each side, deciduous or persistent and finally recurved; flowers perfect, axillary, minute, reported as yellowish, greenish brown, or purple, pedicellate, the pedicel not articulate, elongating in fruit and often recurved; hypanthium turbinate-globose, the calyx entire; corolla campanulate or rotate, glabrous, 4-lobate, the lobes triangular, subacute, valvate in bud; stamens 4, inserted between the corolla lobes, the short filaments subulate, the anthers dorsifixed, oblong; ovary 2-celled, the style short, thick, with two short divaricate branches; ovules solitary, affixed to the septum below the middle; fruits didymous, black or dark blue, lustrous, the lobes globose, somewhat fleshy, one lobe often smaller than the other and imperfect.

Didymaea, which occurs from central Mexico southward to Panama, was considered to consist of only two species [*D. alsinoides* (Schlecht. & Cham.) Standl., divided into three varieties, and *D. linearis* Standl.]. This, however, seems to be far from the actual state of affairs. The genus is found quite commonly in Central America and, although fruiting materials are abundant, those with usable flowers are not. The group may be complicated by cleistogamy and perhaps even apogamy.

Since it seems reasonably certain that *D. alsinoides* does not occur in Guatemala or Central America, but that there are three distinctive species in Guatemala (plus one which seems to be vegetatively distinctive but lacks usable flowers or fruits), a necessary combination and two new species are described below. This is a departure from the usual practice of this flora but is necessitated by publishing deadlines.

Leaves broadly ovate to suborbicular, base obtuse or rounded.....*D. australis*.
Leaves linear-lanceolate to lanceolate, rarely ovate, bases acute or cuneate to obtuse.

Leaves without obvious lateral nerves.....*D. microphylla*.

Leaves with obvious lateral nerves, either penni- or plinerved.

Leaves 3-(5-) plinerved, sparsely hispidulous.....*D. hispidula*.

Leaves penninerved, leaves and stems glabrous or obscurely puberulent

D. microflosculosa.

Didymaea australis (Standl.) L. Wms., comb. nov. *Didymaea alsinoides* var. *australis* Standl. Field Mus. Bot. 18: 1291. 1938. Figure 68.

Wet mountain forests, 1,800-2,400 m.; San Marcos (*Williams, Molina & Williams 25765*). Costa Rica (type, *Brade & Brade 2143*); Panama.

Procumbent or scandent herbs, sparsely pilosulose or glabrous; leaves broadly ovate to suborbicular, acute or subacute, the base rounded or subtruncate or subdecurrent on the petiole, triplinerved, glabrous or nearly so, the blade 10-18 mm. long and 8-12 mm. broad; inflorescences axillary, 1-flowered; pedicel slender, to 10 mm. long; fruit didymous, fleshy, black.

A single Guatemalan collection seems referable to this broad-leaved species from the southern part of the range of the genus.

Didymaea hispidula L. Wms. sp. nov. Figure 68.

Thickets and mixed coniferous-oak forests, 1,600-3,000 m.; Jalapa; Jutiapa; Chiquimula; Chimaltenango; Sacatepéquez; Huehuetenango; Quezaltenango; San Marcos (type, *Williams, Molina & Williams 25896*).

Planta herbacea usque ad 1 m. longa; caulibus graciles 4-angulati hispiduli; folia lanceolata acuminata breviter petiolata hispidula 3-(5-) plinervia; stipulae interpetiolatis lobis linearibus; inflorescentiae axillares uniflores, pedicelli graciles; flores desideratur; fructus didymus lucens nigrescens, lobis globosis carnosulis.

Small herbaceous vines perhaps to 1 m. or more long; stems slender, brittle, 4-angulate, hispidulous becoming glabrous, internodes 4-8 cm. long; leaves lanceolate, acuminate, short petiolate, hispidulous especially along the margins, 3-(5-) plinerved the blades mostly 1-3(4) cm. long and 0.4-1(1.5) cm. broad, the petioles mostly 0.5 cm. long, rarely to 1.5 cm. long; stipules interpetiolar, about 1 mm. long, divided to the base and the lobes linear, hispidulous; inflorescence axillary, 1-flowered, pedicels slender, mostly 5-10 mm. long; mature flowers not known, the buds minute and possibly cleistogamous (or apogamous?); fruits didymous, fleshy, black and shining, 5-8 mm. long and about 10 mm. broad across the lobes.

Common in Guatemala and distinguished from the other species by the plinerved hispidulous leaves, and the deeply divided stipules. It is a species of the coniferous and oak forests at middle and high elevations. The holotype is from "forested mountain slopes and ravines, Sierra Madre Mountains about 6 km. (airline) north of San Marcos, dept. San Marcos, alt. 2,700 m., Dec. 13, 1963, *Williams, Molina & Williams 25896* (F).

Didymaea microflosculosa L. Wms. sp. nov. Figure 68.

Wet forests or cloud forests, 1,500-2,000 m., Guatemala; Escuintla; Chimaltenango; Sololá; Huehuetenango; Quezaltenango;

San Marcos [type: *Williams, Molina & Williams 25944* (F)]. Honduras.

Herbae parvae scandentes usque ad 1 m.; caules graciles 4-angulati glabri vel obscure puberulenti; folia late vel anguste lanceolata acuminata penninervia lucentia obscure puberulentia; inflorescentiae axillares uniflores; pedicelli graciles; flores vinacei; corolla rotata 4-lobata, lobis ellipticis acutis trinervis; fructus didymus nigrescens carnosus.

Herbaceous or scandent vines to perhaps a meter long; stems slender, 4-angulate, glabrous or at first obscurely puberulent, the internodes to 10 cm. long or more; leaves broadly to narrowly lanceolate, acuminate, acute or somewhat obtuse at the base, penninerved, shining, glabrous or obscurely puberulent, the blades mostly 2.5-4 cm. long and 0.7-1.5 cm. broad, petioles to 0.8 mm. long; stipules interpetiolar, lanceolate, bifid to about the middle or sometimes entire, usually deciduous; inflorescence axillary, 1-flowered or sometime juvenile branches appear to have a cymose, 3-flowered inflorescence; flowers small, dull red; calyx reduced to an obscure ring; corolla rotate, about 3 mm. long, 4-lobate nearly to the base, the lobes about 3 mm. long and 1.2 mm. broad, elliptic, acute, trinerved; fruits didymous, black, shining, somewhat fleshy, to about 7 mm. high and 10 mm. broad.

Common in the cloud forest areas of Guatemala and Honduras. The type is: wet mountain forest near Aldea Fraternidad, between San Rafael Pie de la Cuesta and Palo Gordo, west facing slopes of the Sierra Madre Mountains, department of San Marcos, alt. 1,800-2,400 m. December 10-18, 1963, *Williams, Molina & Williams 25944* (F). Twenty-nine other collections from Guatemala and Honduras are available.

***Didymaea microphylla* L. Wms. sp. nov.**

Pine or broadleaf forested slopes of the highland volcanoes or mountains, 2,400-4,000 m.; Sacatepéquez; Chimaltenango; Huehuetenango; Quezaltenango. Endemic.

Herbae perparvae, caulibus 4-angulatis hispidulis glabrescentes; folia lanceolata vel elliptico-lanceolata apiculata leviter carnosae revoluta hispidula aut glabrescentes; stipulae bifidae lobis linearibus; inflorescentiae uni- vel rariores biflorae; calyces perparvi aut nulli; corollae parvae 4-lobatae, tubi perbreves, lobis ovatis 3-plinerviis; fructi carnosi nigri didymi.

Small herbaceous vines to 1 m. or less long, the stems 4-angulate, retrorse hispidulous, glabrescent with age, stramineous; leaves small, lanceolate or elliptic-lanceolate, sometimes ovate, acute and apiculate, somewhat fleshy and the margins revolute, hispidulous or glabrescent, blades 4-9(-14) mm. long and 3-4(-8) mm. broad without conspicuous lateral nerves, petioles often narrowly winged, mostly less than 2 mm. long; stipules about 1 mm. long, bifid to about the middle, the lobes linear; inflorescences axillary (or terminal), uniflorous or rarely biflorous, the peduncles short in anthesis, to 1 cm. long in fruit and somewhat reflexed; hypanthium glabrous, at anthesis about 0.5 mm. long; calyx none or inconspicuous; corolla small, rotate, 4-

lobate, glabrous, the tube very short, about 0.2 mm. long, the lobes ovate, about 2 mm. long and 1.5 mm. broad, prominently 3-plinerved; anthers in the sinu of the corolla lobes, about 0.4 mm. long, cordate; fruit fleshy, black and shining, didymous or only one lobe developing.

Guatemala: narrow ridge of Volcán Santo Tomás, Dept. Quezaltenango, alt. 2,500-3,700 m., Jan. 22, 1940, *Steyermark 34790* (type, F).

Distinguished from the other species in Guatemala by the very small somewhat fleshy leaves without lateral nerves visible.

DIODIA Linnaeus

Annual or perennial herbs, rarely low shrubs, sometimes scandent, branched, glabrous or rough-pubescent, the stems terete or 4-angulate; leaves opposite, sessile or nearly so, mostly narrow but sometimes ovate; stipules united with the petioles to form a setiferous sheath; inflorescence axillary, sessile, the flowers small or minute, white or purple; hypanthium obconic or obovoid, the calyx usually 2-4-dentate, sometimes with alternating smaller teeth, persistent; corolla funnelform, the tube short or elongate, the throat glabrous or villous, the limb commonly 4-lobate, the lobes ovate-triangular, valvate in bud; stamens normally 4, inserted in the corolla throat, the filaments filiform; anthers dorsifixed, linear-oblong, exserted; ovary 2-celled, the style filiform, exserted, with 2 very short branches or a bilobate capitate stigma; ovules solitary, affixed to the middle of the septum; fruit 2-coccous, the cocci crustaceous, smooth or costate dorsally, indehiscent, without an interposed axis.

About 30 species in tropical America, a few in tropical Africa. A few species besides those listed here occur in southern Central America.

Diodia conferta DC., *D. setigera* Sw. and *D. prostrata* Sw. are reported from Guatemala by Hemsley but we have seen no Guatemalan specimens of these species.

The genus *Crusea* can be distinguished from *Diodia* in no very substantial way and certain of the species of *Crusea* look more like *Diodia* than they do to the remaining *Cruseas*. A careful generic evaluation in this tribe is much needed.

Plants erect shrubs, 30-60 cm. high, with definitely woody branches; upper leaves greatly reduced and bract-like, the inflorescence thus spike-like.

D. brasiliensis var. *angulata*.

Plants herbaceous, sometimes perennial but the stems not woody; upper leaves not or scarcely reduced.

Plants prostrate, glabrous or nearly so, growing on seashores.....*D. maritima*.

Plants erect or scandent, abundantly pubescent with harsh hairs, not confined to seashores.

Plants usually scandent; leaves lanceolate or ovate-oblong, mostly 1-2 cm. broad.

D. sarmentosa.

Plants not scandent; leaves narrowly or broadly linear, rarely as much as 4 mm. broad.

Cocci of the fruit 3-costate dorsally, glabrous or nearly so.....*D. rigida*.

Cocci not costate, pubescent, usually densely so.

Stems glabrous; flowers in small, chiefly terminal heads.

See *Crusea diversifolia*.

Stems usually densely hirsute or hispidulous; flowers axillary.....*D. teres*.

Diodia brasiliensis Spreng. var. ***angulata*** (Benth.) Standl. Carnegie Inst. Wash. Publ. 461: 90. 1935. *Triodon angulatum* Benth. Pl. Hartw. 70. 1840. *Tomillo silvestre*. Figure 62.

Petén; Alta Verapaz; 300-1,400 m., in moist meadows or pastures or on rocky stream banks, common; British Honduras; southern Mexico to Honduras and Costa Rica; typical form of the species in eastern Brazil and southward.

A stiff, densely branched shrub commonly 30-40 cm. high, sparsely puberulent or almost glabrous, the branches sharply 4-angulate, densely leafy; leaves short-petiolate, deep green, plane, oblong to elliptic, 5-20 mm. long, often appearing verticillate, scaberulous on the margin and costa, the nerves obsolete; flowers very small, greenish white, densely clustered in the axils of the greatly reduced upper leaves and forming a spiciform inflorescence; calyx minute, 4-dentate; corolla 2 mm. long; fruit broadly turbinate, green, glabrous, the cocci not costate dorsally.

By Bentham the plant was referred to a distinct genus, *Triodon*, which has been maintained by some authors, with little reason. In general appearance it does differ greatly from other members of the genus, but the flower and fruit characters are those of *Diodia*. The North American material differs little if at all from the Brazilian plant.

Diodia maritima Thonning ex Schumacher, Besk. Guin. Pl. 75. 1827.

On sea beaches, British Honduras (New Town, *Schipp* 809); to be expected on the beaches of Izabal. Honduras; Nicaragua; Costa Rica; West Indies; Colombia; tropical Africa.

Plants prostrate, the stems coarse and stout, elongate, tetragonous, usually much branched, glabrous or nearly so, 1.5 m. long or less, usually densely leafy and often forming mats; leaves oblong or oblong-lanceolate, 1.5-3 cm. long, subsessile, acute or obtuse, thick and when dry somewhat coriaceous, narrowed at the base; setae of the sheaths about 3 mm. long; flowers solitary, sessile in the leaf axils; calyx lobes 4, lanceolate, 2 mm. long; corolla white, 6-7 mm. long; fruit ellipsoid, glabrous, 5-7 mm. long.

Diodia rigida (Willd.) Schlecht. & Cham. Linnaea 3: 341. 1828. *Spermacoe rigida* Willd. ex Roem. & Schult. Syst. Veg. 3: 531.

1818. *D. pulchella* Brandege, Univ. Calif. Publ. Bot. 10: 418. 1924 (type from Chiapas). *Mielillón*; *pegajosa*; *pelosa* (fide Aguilar).

Common and widely distributed in hills and mountains, 2,400 m. or lower, usually in pine or oak forest, grassy fields and hillsides, rocky banks, and other situations. Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Chimaltenango; Quiché; Huehuetenango. British Honduras, and to be expected in Petén. Southern Mexico to Panama, and widely dispersed in South America.

Plants usually perennial, often from a somewhat woody base, procumbent, much branched, at least from the base, the stems stout, rarely more than 30 cm. long, hirsute or hispid with whitish spreading hairs, the internodes short; leaves linear, mostly 1.5-3 cm. long, thick and stiff, broadest near the base, attenuate to a setiferous apex, hispidulous or hirsute, usually revolute; calyx lobes short, subulate-lanceolate, ciliate, erect, green; corolla pale purple, 8-10 mm. long, hispidulous outside on the lobes, the tube glabrous; fruit subglobose, closely sessile, 3 mm. long, glabrous or nearly so, conspicuously tricostate dorsally, at least when fully developed.

Very closely allied to *D. teres* and perhaps only varietally distinct.

Diodia sarmentosa Swartz, Prodr. Veg. Ind. Occ. 30. 1788. Figure 62.

Pine forest, wet thickets, and brushy slopes, chiefly at 600-1,400 m., sometimes at lower elevations, most abundant in Alta Verapaz; Petén; Izabal; Chiquimula; Suchitepéquez; Sololá; San Marcos. Southern Mexico to Panama, Guianas, and West Indies.

Plants sometimes procumbent but usually more or less scandent over shrubbery, often forming dense tangles, the stems often 2 m. long or even more, 4-angulate, brown, hispidulous or puberulent; stipule sheaths conspicuous, bearing numerous long brown slender bristles; leaves lanceolate or oblong-lanceolate, 3.5-5 cm. long, acuminate, obtuse at the base, aculeolate-serrulate, scabrous above, rather densely hispidulous beneath, the lateral nerves very conspicuous, oblique, impressed above; flowers sessile, 6-8 in the leaf axils; sepals 2-4, ovate, acuminate, ciliate; corolla white, about 2 mm. long; capsule puberulent, the cocci 5 mm. long, not costate dorsally.

A common weedy plant of the Cobán region, especially on cut-over land, where it frequently is associated with *Dicranopteris* and other scrambling plants.

Diodia teres Walt. Fl. Carol. 87. 1788. *D. prostrata* Swartz, Prodr. Veg. Ind. Occ. 30. 1788.

Moist or dry, oak or pine forest, grassy plains, or cornfields, 200-1,800 m.; Zacapa; Jalapa; Guatemala; Chimaltenango;

Huehuetenango. Widely distributed in the United States; Mexico; ranging southward to Costa Rica and South America.

Plants usually stiffly erect, annual, strict or often copiously branched from or above the base, the stems slender and wiry, hispidulous and hirsute with whitish hairs; stipule sheaths conspicuous, with numerous long slender whitish setae; leaves linear or lance-linear, attenuate to the setiferous apex, broadest near the base, scaberulous and hirsute, usually revolute, with thickened margins, 1-nerved; flowers sessile, solitary or clustered in the leaf axils, the sepals short, acute, greenish; corolla small, white or purplish, usually 3-4 mm. long; fruit about 3 mm. high, densely covered with short, whitish, spreading or appressed hairs, the carpels rounded on the back, not at all costate.

As this species has been subdivided by Fernald and Griscom, the Guatemalan material would fall under var. *setifera* Fernald & Griscom (Rhodora 39: 307. 1937), ranging from Michigan to Texas and southward. The variety, however, seems to have little taxonomic importance, and is not separated definitely from the typical form of the Atlantic region of the United States. The terminal bristles of the leaves which are supposed to separate the western plant from the eastern are almost as conspicuous in plants of the Atlantic coast as in Mexican ones, and are by no means lacking, as claimed by those authors.

DUROIA Linnaeus f.

Shrubs or trees, unarmed, glabrous or pubescent, the branchlets terete or tetragonous; stipules interpetiolar, oblong, deciduous; leaves opposite or verticillate, sessile or petiolate, coriaceous to membranaceous; flowers unisexual, often large, white or yellowish, in terminal, sessile or pedunculate fascicles or cymes, the pistillate rarely solitary; hypanthium oblong to hemispheric; calyx cupular or tubular, persistent, truncate or 6-9-lobate; corolla salverform, often coriaceous, sericeous outside, the throat pilose or naked, the limb 6-9-lobate, the lobes oblong, contorted in bud; stamens 6-9, inserted in the corolla tube, the filaments very short or none; anthers dorsifixed, linear, acute, included; ovary 2-4-celled, the style short, with 2 broad acute coherent branches; ovules numerous, biseriate, the placentae affixed to the septum; fruit baccate, globose to oblong, with a thick cortex, 2-4-celled or 1-celled; seeds large, horizontal, much compressed, suborbicular, covered with pulp, the testa thin, black.

A small genus with one species in Costa Rica, the others, besides the one here listed, South American. The genus is hardly distinct from *Amaioua*.

Duroia genipifolia Standl. & Steyerl. Field Mus. Bot. 22: 186. 1940.

Type from Izabal, Río Dulce, between Livingston and 6 miles up river, at sea level, *Steyermark* 39382; also no. 39572 from the same general region.

A large shrub or small tree with thick glabrous branchlets; stipules deciduous, almost 1 cm. long, subulate-attenuate, densely pilose; leaves large, short-petiolate, membranaceous, the densely pilose petiole 1.5 cm. long; leaf blades obovate-oblong or oblanceolate-oblong, 20-30 cm. long, 8-10 cm. broad, acuminate, gradually narrowed to the acute base, sparsely hirtellous above, rough to the touch, densely short-pilose beneath with spreading hairs, the lateral nerves about 16 on each side; staminate flowers capitate-congested at the ends of the branches, numerous, sessile or short-pedicellate; hypanthium campanulate, 5-6 mm. long, densely hispidulous; calyx truncate, the 5 lobes subulate, erect, unequal, 8 mm. long or less; corolla in bud 18 mm. long, attenuate to the apex, whitish-strigose, the lobes linear-attenuate, three times as long as the tube, contorted.

EIZIA Standley

Almost glabrous shrubs, the branchlets subterete; stipules interpetiolar, very short, reduced almost to a line; leaves opposite, petiolate, membranaceous; inflorescence terminal, cymose, lax, few-flowered, pedunculate, the flowers large, pedicellate, the bracts and bractlets inconspicuous; hypanthium clavate, attenuate to the base, costate-angulate; calyx deeply 4-lobate, green, the lobes broad, persistent; corolla salverform, the very long tube slender, slightly dilated upward, glabrous within, the 4 lobes slightly imbricate (or convolute?) in bud, spreading, oblong, glabrous within; stamens 4. inserted at the apex of the tube, the filaments very short; anthers dorsifixed, erect, obtuse, subexserted; ovary 2-celled, the style very long and slender, included, shortly bifid at the apex; ovules numerous; capsule obovoid, costate, produced above the persistent calyx, subcoriaceous, septicidally bivalvate at the apex, the valves biparted at the apex; seeds numerous, angulate, tuberculate-rugose.

The genus consists of a single species.

Eizia mexicana Standl. Field Mus. Bot. 22: 50. 1940.

Type from Volcán de Tacaná, Chiapas, at 1,000-2,000 m., *Matuda* 2402; doubtless occurring on the Guatemalan side of the volcano.

Petioles glabrous, slender, 1-2.5 cm. long; leaf blades ovate or oblong-ovate, 7.5-10 cm. long, 2.5-5.5 cm. broad, narrowly long-acuminate, obtuse or acute at the base and often somewhat oblique, glabrous above, barbate beneath in the nerve axils, the lateral nerves about 6 on each side; peduncles 1.5 cm. long or less, the inflorescence sometimes sessile, few-flowered, as much as 7 cm. long and broad, the stiff pedicels 1.5-2.5 cm. long; hypanthium glabrous, 4-5 mm. long, the calyx 2 mm. long, its lobes broadly triangular, acutish; corolla puberulent outside, at least above, the tube 5 cm. long, 4 mm. broad at the throat, the lobes 8 mm. long; anthers 6 mm. long; capsule about 12 mm. long and 8 mm. broad, obtuse or subacute at the base; seeds irregularly angulate, 0.6-0.8 mm. in diameter, dark brown.

The genus was named for its collector, Eizi Matuda, who made extensive collections in Chiapas near the Guatemalan border, especially upon the Volcano of Tacaná, over whose summit the international boundary passes.

ELAEAGIA Weddell

Trees or large shrubs, pubescent, with terete branches; stipules interpetiolar, free or connate at the base; leaves opposite, petiolate, coriaceous to membranaceous; flowers small, in terminal racemes or panicles; hypanthium small, hemispheric, sulcate; calyx somewhat ampliate, 5-lobate, persistent; corolla short-funnelform, the throat villous, the limb 5-lobate, the lobes oblong, recurved, contorted in bud; stamens 5, inserted between the corolla lobes, the filaments exerted; anthers dorsifixed, oblong; ovary 2-celled, the style short, bifid, with short obtuse branches; ovules numerous, crowded, the placentae peltately attached to the septum; capsule very small, crustaceous, crowned by the persistent calyx, 2-celled, loculicidally bivalvate, the valves finally bifid; seeds numerous, minute, elongate, with membranaceous testa.

One other species is known from Costa Rica, and a small number of others are confined to South America, chiefly in mountainous areas.

Elaeagia auriculata Hemsl. Diag. Pl. Mex. 32. 1879.

Known in Guatemala only from sterile material, almost surely referable here, collected on Cerro Tixixí, north of Jocotán, Chiquimula, at about 1,300 m., *Steyermark* 31579. Mountains of Honduras and Costa Rica.

A shrub or tree of 3-8 m., in Honduras reported to reach a height of 24 m., the branchlets tomentulose; stipules very large, 5 cm. long or even larger; leaves sessile or nearly so, ovate-elliptic to rounded-elliptic-obovate, as much as 40 cm. long and 23 cm. broad or even larger, but often smaller, acute or abruptly short-acuminate, narrowed to the auriculate base, densely and softly short-pilose, especially beneath; flowers white, in large broad sessile panicles; calyx and hypanthium puberulent, together scarcely more than 2 mm. long; corolla 3-4 mm. long, glabrous outside, lobate almost to the base; capsule subglobose, 3 mm. in diameter.

Said to be called "jagua" in Honduras.

ERNODEA Swartz

Small shrubs usually near or along the sea beaches; stems terete or angled, the internodes shorter than the leaves, stipules forming a sheath, this bidentate or entire, intrapetiolar. Leaves opposite, coriaceous, sessile or nearly so; inflorescence axillary, usually consisting of a single flower; flowers small; calyx tubular, 4-5-lobate, the lobes erect, subulate-lanceolate; corolla with a narrow elongated tube, the throat naked, the 4-6 lobes spreading, linear, valvate; stamens 4-6, inserted on the tube,

anthers exserted, linear; style somewhat bilobate, long and exserted; fruit a somewhat fleshy drupe, indehiscent, obovoid, with a single seed in each cell.

A small genus of perhaps some nine species, only the following widely distributed.

Ernodea littoralis Sw. Nov. Gen. & Sp. Pl. Prodr. 29. 1788.

Figure 60.

Coastal thickets near the sea; Florida and the Yucatan Peninsula to British Honduras, the West Indies to Colombia.

Small erect or usually repent shrubs up to 1 m. tall. Leaves coriaceous, lanceolate to linear-lanceolate, acute, glabrous, to about 4 cm. long and 1 cm. broad (ours), sessile or nearly so; the inflorescences of single axillary flowers; the calyx 4-lobate, the lobes linear to subulate-lanceolate, 2-3 mm. long; corolla usually reddish, the tube about 1 cm. long, the lobes linear, spreading, 4-5 mm. long; fruits subbaccate, obovoid with persistent calyx, about 5 mm. long.

Known from Central America only from British Honduras.

EXOSTEMA L. Richard

Shrubs or trees, glabrous or pubescent, the branchlets usually terete; stipules interpetiolar, deciduous or persistent; leaves opposite, petiolate or subsessile, membranaceous or coriaceous; flowers small or large, axillary and solitary or arranged in terminal panicles or corymbs, pedicellate, bracteolate or ebracteolate; hypanthium cylindric or obovoid; calyx normally 5-lobate, the lobes broad or narrow; corolla short or elongate, the tube elongate, often very long, the throat glabrous or pilose, the limb 5-lobate, the lobes oblong or linear, imbricate in bud, two of them exterior; stamens 5, inserted at the base of the corolla tube, the filaments filiform, elongate; anthers basifixed, linear, usually exserted; ovary 2-celled, the style filiform, usually exserted, the stigma capitate, entire or bilobate; ovules numerous, ascending, the placentae adnate to the septum; capsule 2-celled, usually oblong-cylindric, septicidally bivalvate, the valves entire or biparted; seeds numerous, imbricate, the body oblong, compressed, the testa produced into a wing.

About 35 species, chiefly West Indian, one or two others in Mexico, and several in the mountains of South America.

Flowers axillary, mostly solitary *E. caribaeum*.

Flowers in terminal or axillary panicles *E. mexicanum*.

Exostema canescens Bartl. is reported from Guatemala by Hemsley. The application of the name is uncertain, and it is doubtful what the Guatemalan plant so reported may be, possibly *E. mexicanum*.

Exostema caribaeum (Jacq.) R. & S. Syst. Veg. 5: 19. 1819.
Cinchona caribaea Jacq. Enum. Pl. Carib. 16. 1760.

Dry, brushy, often rocky slopes, 400-1,300 m.; Chiquimula; Huehuetenango. British Honduras, and to be expected in Petén; southern Mexico to Honduras and Costa Rica; southern Florida and West Indies; northwestern coast of South America.

A shrub or tree, rarely more than 8 m. high, the branchlets glabrous; stipules 2.5-5 mm. long; leaves short-petiolate, the blades mostly ovate, 5-11 cm. long, 1.5-5 cm. broad, rather abruptly acuminate, obtuse or acute at the base, glabrous above, usually glabrous beneath except in the barbate nerve axils, rarely white-pilose with short hairs; flowers solitary in the leaf axils, the stout pedicels 4-10 mm. long; hypanthium glabrous, 4-5 mm. long; calyx lobes 1 mm. long or less, broad, obtuse or acutish; corolla white, glabrous, the tube 3-5 cm. long, 2 mm. thick, often curved, the lobes linear, recurved, about equaling the tube; stamens long-exserted, the linear anthers 2 cm. long; capsule oval or ellipsoid, 1-1.5 cm. long, smooth, dark brown, lustrous; seeds oval, 3-6 mm. long, with a narrow brownish wing.

Maya names of Yucatan are reported as "zabacche" and "chactsiis." The leaves and bark are bitter, and formerly the plant was used in some parts of its range as a substitute for quinine.

Exostema mexicanum Gray, Proc. Am. Acad. 5: 180. 1861.
Quina; melena de león (fide Aguilar). Figure 17.

Dry or wet forest, usually along stream banks, 1,500 m. or lower; Petén; Escuintla; Retalhuleu; Quiché; Huehuetenango. Southern Mexico; British Honduras; Honduras; El Salvador; possibly Costa Rica.

A small or large tree, reported as reaching a height of 23 m. with a trunk diameter of 40 cm., the slender branchlets glabrous or obscurely puberulent, conspicuously lenticellate; stipules 2.5-4 mm. long, triangular, acuminate or cuspidate; petioles 1 cm. long or less, the blades ovate to oval or oblong-ovate, 5-15 cm. long, 2-7.5 cm. broad, abruptly acuminate or attenuate, very obtuse or broadly rounded at the base, barbate beneath in the nerve axils, otherwise glabrous or nearly so; inflorescence cymose-corymbose, 7-10 cm. broad, densely many-flowered, the slender pedicels 2-4 mm. long, minutely puberulent; hypanthium 2.5-3 mm. long, sparsely and minutely puberulent; calyx lobes minute, deltoid, acute; corolla sparsely villosulous, the tube 8-10 mm. long, the lobes oblanceolate-linear, obtuse, 1 cm. long; anthers 3.5-4 mm. long; capsule clavate-obovoid, about 1 cm. long, dark brown, conspicuously whitish-lenticellate.

Called "quina" in El Salvador. The Maya name "sabac-ché" is reported from British Honduras. The flowers are fragrant. In Huehuetenango a decoction of the bitter bark is employed as a remedy for malaria.

FARAMEA Aublet

Shrubs or small trees, usually glabrous throughout, the branchlets compressed, terete, or tetragonous; stipules intrapetiolar, short-triangular and apically long-

aristate or often long-sheathing, usually persistent; leaves opposite, petiolate or sessile, chiefly coriaceous and oblong or lanceolate; inflorescence various, terminal or axillary, few-many-flowered; hypanthium ovoid or turbinate, terete or angulate; calyx cupular or short-tubular, persistent, truncate or rarely 4-dentate; corolla commonly salverform, the tube short or elongate, the throat naked, the lobes 4 (rarely 5) usually linear or lanceolate, valvate in bud, spreading or recurving; stamens 4, or rarely 5, inserted in the tube or throat of the corolla, the filaments short or long; anthers dorsifixed near the base, included or exserted, linear; ovary 1-celled, the style filiform, with 2 short branches; ovules geminate, basilar and collateral, erect; fruit coriaceous, globose or transverse-oblong, terete or costate, 1-celled and 1-seeded; seed transverse, usually deeply excavate at the base, large, with very thin testa and corneous endosperm.

A large genus of tropical America, most of the species South American, a few others occurring in Mexico and southern Central America. The group is easily recognized by the single large seed, sometimes horizontal.

Flowers fasciculate or solitary in the leaf axils.....*F. cobana*.

Flowers in few- to many-flowered pedunculate inflorescences.

Inflorescence a short few-flowered raceme; calyx about 1 mm. long.

F. standleyana.

Inflorescence not racemose, usually many-flowered cymes or corymbs.

Stipules distinct or nearly so; corolla white.....*F. occidentalis*.

Stipules united for half or even most of their length.

Corolla pale blue; corolla lobes usually longer than the tube....*F. brachysiphon*.

Corolla white; corolla lobes about equaling the tube.....*F. belizensis*.

***Faramea cobana* Donn.-Sm. Bot. Gaz. 57: 422. 1914.**

Moist or wet, mixed, mountain forest, 1,200-1,600 m.; endemic; Alta Verapaz (type from forest near Cobán, *Tuerckheim* 2474); Huehuetenango (Cerro Chiblac).

A glabrous shrub 1-2.5 m. high, the branchlets angulate; stipules long-aristate from a short base; petioles only 2-4 mm. long, the blades oblong-lanceolate, 5.5-7.5 cm. long, 1.3-2 cm. broad, narrowed to a narrowly obtuse apex, acute at the base, the lateral nerves 9-11 on each side; pedicels solitary or fasciculate in the upper leaf axils, about equaling the flowers, filiform, 12-25 mm. long; calyx and hypanthium 2 mm. long, the hypanthium turbinate, the calyx minutely denticulate; corolla blue or white, about 12 mm. long, the tube gradually dilated upward, the lobes oblong-ovate, half as long as the tube or longer; anthers included, 4 mm. long; fruit globose, blue, smooth, 9 mm. in diameter.

***Faramea belizensis* Standl. Carnegie Inst. Wash. Publ. 461: 90. 1935.**

Type *Schipp* S-721 from Camp 36 of the Guatemala-British Honduras boundary, Petén, alt. 810 m.

A glabrous tree, 8 m. high, the trunk 7.5 cm. in diameter, the branchlets obtusely tetragonous; stipules 5-8 mm. long, connate half their length, the free portion short-mucronate; leaves coriaceous, darkening when dried, on petioles 1 cm. long or less, ovate to oblong, about 14 cm. long and 4-7.5 cm. broad, caudate-acuminate, obtuse or acute at the base, the lateral nerves about 13 on each side; inflorescence terminal, cymose-umbellate, many-flowered, about 5 cm. long and 7 cm. broad, long-pedunculate, the flowers in 3-flowered cymules, the pedicels stout, 3-5 mm. long; hypanthium obovoid, 1.5 mm. long; calyx tubular-campanulate, 3-5 mm. long, truncate; corolla attenuate in bud, white, the rather thick tube 1 cm. long, the linear attenuate lobes of about the same length.

The collector states that this is a "very handsome" shrub or small tree, seen only at high altitudes on mountain slopes in dense shade; "rare." The flowers are said to be fragrant.

Faramea brachysiphon Standl. Field Mus. Bot. 8: 62. 1930. *Tinta*.

Dense wet mixed lowland forest, 500 m. or lower; Alta Verapaz; Izabal; Huehuetenango. British Honduras, the type from Middlesex, *Schipp* 345.

A glabrous shrub or small tree 2.5-6 m. high, the branchlets subterete; stipules green, the sheath 3-4 mm. long, mucronate, the mucro about 1 mm. long; leaves on petioles 4-7 mm. long, subcoriaceous, oblong or narrowly oblong, 11-17 cm. long, 3-5 cm. broad, subabruptly acuminate, acute at the base, the lateral nerves about 15 on each side; inflorescence cymose-paniculate, about 3.5 cm. broad, on a peduncle 2-2.5 cm. long, the flowers few or numerous, rather densely crowded, the pedicels 1-2 mm. long; hypanthium broadly oblong, 1.5 mm. long, the calyx teeth triangular, minute, scarcely 0.5 mm. long; corolla pale blue, glabrous, the rather thick tube 3 mm. long, the lobes lance-oblong, 6-7 mm. long, obtuse, spreading; anthers linear, partly exerted.

The fruit, not seen, is described as globose and dull green.

Faramea occidentalis (L.) A. Rich. Mém. Soc. Hist. Nat. Paris 5: 176. 1834. *Ixora occidentalis* L. Syst. Nat. ed. 10. 2: 893. 1759. *F. odoratissima* DC. Prodr. 4: 496. 1830. *Cerezo de montaña* (Quezaltenango). Figure 55.

Rather widely distributed, especially in the lowlands of both slopes, ascending in the mountains of the western highlands to 1,500 m., and descending to sea level, in dense wet mixed forest or sometimes in dry thickets of the Pacific coastal plains; Petén; Izabal; Suchitepéquez; Retalhuleu; Quezaltenango; San Marcos. Southern Mexico; British Honduras to Panama, southward to Peru; West Indies.

A slender glabrous shrub or tree, rarely 9 m. high, usually much lower, the branchlets green, subterete; stipules short and small, long-aristate; leaves short-petiolate, oblong or lance-oblong, short-acuminate or caudate-acuminate, acute to attenuate at the base, often turning dark when dried; inflorescences chiefly terminal, few-flowered, corymbose, sometimes umbelliform, the flowers long-pedicellate, fragrant; hypanthium obovoid, 2 mm. long; calyx cupular, 3 mm. long, obscurely denticulate; corolla white, glabrous, 2-2.5 cm. long, the linear-lanceolate attenuate lobes equaling or longer than the tube, 4 or rarely 5 (as in illustration); anthers included; fruit depressed-globose, about 1.5 cm. broad, purple or wine-purple at maturity or almost black.

In Mexico the shrub often is known by the name "cafecillo," and from Oaxaca the names "huesillo" and "azucenilla" are reported.

The species is a variable one and it is possible that there is more than one species in the material we have placed here. The great altitudinal range is unusual.

***Faramea standleyana* L. Wms. Phytologia 26: 490. 1973.**
Figure 56.

Known only from rocky slopes of Cerro San Gil, along Río Frío, Dept. Izabal, *Steyermark* 39962. Endemic.

Shrubs to about 2 m. tall, entirely glabrous; the branchlets terete, the internodes 5-7 cm. long; stipules intrapetiolar, about 5 mm. long, the long aristate tip to 1 cm. long; leaves elliptic or elliptic-oblancheolate, abruptly and shortly acuminate, attenuate to the base, with 8-10 pairs of lateral nerves, blades 11-15 cm. long and 2-6 cm. broad, petiole 1-1.5 cm. long; inflorescence terminal, a few-flowered raceme, the peduncle slender, about 2 cm. long, the pedicels up to 1 cm. long; calyx suburceolate, about 1 mm. long, lobed to the middle, the lobes triangular, acute; corolla white with the tube pale lilac, salverform, the tube slender, 2-2.5 cm. long, the lobes lanceolate, acute, about 8-9 mm. long; the stamens attached near the middle of the corolla tube, the anthers linear, 8-10 mm. long, the filaments as long as the anthers; style about 15 mm. long, bifid; fruits unknown.

Named for the senior author of this flora, who has described not fewer than 17 species of the genus from tropical North America – and many others from South America.

ADDITIONAL SPECIES:

***Faramea* sp.**

Stann Creek district, British Honduras, *Gentle* 2869.

Small tree to 6 m. and 5 cm. in diameter, completely glabrous. Leaves elliptic, acuminate, attenuate to the short petiole, 9-17 cm. long and 2.5-4 cm. broad, petioles 5-10 mm. long; inflorescence few-flowered subumbellate cymes on peduncles about 1-1.5 cm. long; hypanthium and calyx about 3 mm. long, the calyx about 1 mm. long, the shallow lobes about 0.5 mm. long; disc on summit of ovary exceeding the calyx; fruits verruculose (immature), about 1 cm. wide and half as high.

Related to *F. stenura* Standl. but inadequate for sure determination.

GALIUM Linnaeus

CONTRIBUTED BY LAURAMAY DEMPSTER

References: Greenman, J. M., Revision of the Mexican and Central American species of *Galium* and *Relbunium*, Proc. Am. Acad. 33: 468. 1898. Dempster, L. T., The fleshy-fruited Galiums (Rubiaceae) of Mexico and Central America, Brittonia 25: 15. 1973.

Annual or (ours) perennial herbs, or sometimes suffrutescent; stems square; leaves entire, opposite, but seemingly in whorls or 4-8 because of the leaf-like stipular appendages; inflorescence of simple or usually compound dichasia on lateral branches, or sometimes terminal; flowers small, pedicellate, perfect, polygamous or dioecious; calyx lacking; corolla rotate or sometimes a little campanulate, usually 4-lobed, white, yellow or red; stamens 4, inserted in the corolla throat alternately with the lobes; anthers versatile, oblong; ovary 2-celled, the stigma bifid; ovules 1 in each locule; fruit consisting of 2 dry 1-seeded, usually more or less hemispherical mericarps, or sometimes baccate, often 1-seeded by abortion, glabrous, tuberculate or variously hairy; seeds not dehiscent, the two carpels falling separately at maturity; endosperm horny.

About 400 species, in all continents except Antarctica, 22 in mainland Mexico and Central America.

- Leaves in whorls of 6 to 8.
 - Flowers white; Alta Verapaz*G. mexicanum*.
 - Flowers pink or red; San Marcos and Huehuetenango to Jalapa.
G. mexicanum var. *platyphyllum*.
- Leaves in whorls of 4.
 - Fruits fleshy, glabrous.....*G. aschenbornii*.
 - Fruits dry, not glabrous.
 - Tiny moss-like plants with tuberculate fruits.
G. sphagnophilum var. *mazocarpum*.
 - Larger plants; fruits with curved or uncinat hairs.
 - Corollas a little campanulate, usually hispid externally; plants often prostrate or sprawling.....*G. uncinatum*.
 - Corollas rotate, spreading, glabrous; semierect plants.
 - Leaves more or less obviously 3-nerved, tapered at base and apex, the surfaces hispid or pubescent.
 - Leaves 2-8 mm. long; plants of alpine meadows; corollas usually red.
G. nelsonii.
 - Leaves mostly over 8 mm. long; plants of the forest belt; corollas white or greenish.....*G. orizabense*.
 - Leaves 1-nerved, abruptly petiolate at base, round-apiculate at apex, the surfaces nearly glabrous.....*G. quichense*.

Galium aschenbornii Schauer, Linnaea 20: 701. 1847.
Relbunium aschenbornii (Schauer) Hemsley, Biol. Cent. Am. Bot.

2: 62. 1881. *Rubia acuminata* Mart. & Gal. Bull. Acad. Brux. 11: 127. 1844. *G. geminiflorum* Mart. & Gal. op. cit. 11: 126. *G. galeottianum* Walp. Rep. 6: 17. 1846. *G. uropetalum* Hemsley, op. cit. 66. *Pegapega*; *ojo de perdís*.

Widespread in mountainous areas at 1,200-3,200 m. Climbing on shrubs or trailing on the ground; thickets, banks or grassy slopes, commonly in mixed forest of oak with pine or cypress. San Marcos and southern Huehuetenango to Zacapa, Chiquimula and Utiapa. Mexico; Honduras; El Salvador; Costa Rica; Panama.

Perennial trailing or climbing plants with long (to 120 cm.) slender wiry stems arising in clumps from a small rootstock, or singly from older woody stems, often rooting at the nodes; persistent woody stems remaining slender and wiry; young fertile stems arising singly from the axils, much shorter than the main stems; stems more or less scabrous with very short retrorse aculeolate hairs, or sometimes glabrous toward the end; internodes 1-5 times as long as leaves; leaf surfaces generally glabrous, the margins set with few to many short aculeolate retrorse hairs; leaves ovate, lanceolate, elliptical or oblong, commonly 7-15 mm. long, apparently 1-nerved, apiculate, narrowed more or less abruptly to a short but rather definite petiole; flowers staminate, pistillate, or perfect, on the same plant or on different plants; corollas glabrous, usually red or pink, but sometimes yellow, white, or greenish, the lobes with long slender apices; fruits glabrous, fleshy, green when young, becoming red, then black, wrinkled when mature, 3-7 mm. across when dry.

Known as *bermelloncillo* in Costa Rica, and *mala mujer* in Jalisco.

***Galium mexicanum* HBK.** Nov. Gen. et Sp. 3: 337. 1818. *Pegagosa de pena*; *trementino de cerro*; *flor cadena*.

Plants herbaceous above ground, rooting at the nodes; stems to 240 cm. long, trailing or climbing among shrubs, scabrous with retrorse aculeate hairs, and often also more or less abundantly set with long straight hairs; leaves 1-nerved, 6-8 to a node, 1-2.5 cm. long, one-fourth to two-thirds as long as nodes, variously oblanceolate, tapered gradually to base, and abruptly to the pungent apex; lower midrib and callous margins set with retrorse aculeate hairs, the upper surface with short apically-directed hairs, the lower surface usually more or less hirsute with long slender hairs, but sometimes nearly glabrous; inflorescences on short leafy lateral branches, the pedicels and branchlets divaricate; flowers perfect; ovaries turbinate, densely set with apically-directed, strongly arcuate, hairs; corollas campanulate, cleft about halfway, white, externally set with long hairs, or often not, usually in conformity with the lower leaf surfaces, the lobes relatively short and blunt; fruits dry, set with short apically-directed hairs which are strongly curved throughout their entire length.

Galium mexicanum s.l. is a widespread species whose taxonomy requires much further research, including chromosome study, since polyploidy is known to occur. In the broadest sense, it should include not only the Central American and Mexican plants of the

name, but also those plants of western United States which are generally called *G. asperrimum* Gray.

The plants are extremely adhesive, owing to the many retrorse hairs on stems and leaves, as well as to the strongly curved hairs of the fruits. The former are very effective in helping the plant to climb, and the latter, or both, in seed dispersal. The readiness of this plant to cling to clothing and animal fur accounts for most of the common names. In addition to *pegagosa*, it is also called *esculona*, *rama del coyote*, *flor de pulga*, and *yerba de la pulga* in Mexico. It is said to be put under the bed to catch fleas, and is sometimes sold in the market for this purpose. It is also said to curdle milk.

Galium mexicanum* var. *platyphyllum Greenm. Contr. Gray Herb. n. ser. 14: 458. 1898.

Common in the mountains, 1,300-3,100 m., in wet or moist places in ravines, thickets and mixed forest; San Marcos; Huehuetenango; Quezaltenango; Totonicapán; Quiché; Sololá; Chimaltenango; Sacatepéquez; Guatemala; Baja Verapaz; Jalapa. Mexico. (lectotype from Chiapas, near San Cristóbal, *Nelson 3165* (GH!)), the first of five specimens cited by Greenman).

Corollas pink or red, usually larger than in var. *mexicanum*; leaves commonly somewhat larger and often much broader, usually very abrupt at apex, often truncate or even slightly emarginate.

The original color of dried corollas is always uncertain, but collectors' records indicate that Guatemalan material, except in Alta Verapaz, has consistently red or pink flowers. The leaf characters associated with colored corollas are difficult to define with precision, but are none the less real, as would be apparent from a biometrical study. Outside of Guatemala, red flowers are reported only from Chiapas, the type locality of var. *platyphyllum*.

Galium nelsonii Greenm. Proc. Am. Acad. 33: 460. 1898.

In alpine meadows or among limestone rocks, commonly with Juniper, at 3,300-3,900 m. Huehuetenango. Mexico.

Stems erect, procumbent at base, 4-40 cm. long, nearly glabrous, or sometimes pubescent; leaves 2-8 mm. long, ovate, obscurely to obviously 3-nerved, tapered to a broad base and acute apex, more or less hispid with scattered long hairs; inflorescence racemose, on short, few-flowered, often remote lateral branches that are ascending in flower, divaricate in fruit; corollas rotate, red (or sometimes yellow), glabrous; fruits dry, set with many uncinat hairs.

***Galium orizabense* Hemsley, Diag. Pl. Nov. pars 3:54. 1878.**

Steep moist slopes and canyons in mixed forest, 1,350-2,700 m. The only Guatemalan collections seen were made by von Tuerckheim in the vicinity of Cobán, Alta Verapaz, at 1,350-1,400 m. Mountains of eastern Mexico from Tamaulipas south to Puebla and Vera Cruz; Chiapas. Plants of Costa Rica and Panama are doubtfully referred here.

Erect or subscandent plants, the stems 20-65 cm. long, tufted from a small rootcrown, or commonly rooting at the nodes; stems finely pubescent with curly hairs, the internodes 2-5 times as long as leaves; leaves 3-nerved, 8-25 mm. long, narrowly lanceolate-oblongate to elliptical, drawn to a petiolar base, apiculate or obtuse at apex, sparsely set above and below with curved or curly apically-directed hairs; flowers perfect, minute, commonly 5-15 on short lateral branches; corollas rotate, white or greenish; fruits dry, set with uncinat hairs.

***Galium quichense* Dempster, Phytologia 26: 12. 1973.**

On mossy ledges, about 2,200 m.

Procumbent perennial herb, 10-30 cm. high from a slender taproot or small rootcrown, sometimes rooting at the nodes; stems entirely glabrous, or the sides set with minute upwardly-curved hairs; leaves 3-7 mm. long, 1-nerved, somewhat thick, tapering rather abruptly to a petiole, the blades broadly elliptical to orbicular, apiculate; leaf blades nearly glabrous or with few short hairs on the upper surface, the lower half of the midrib and the petiole densely set beneath with short stout upwardly-curving hairs; lower leaf surface densely and evenly dotted with large glandular cells; inflorescence terminal, pyramidal; pedicels 1-3 times as long as the flowers, very sharply flexed just below the ovary, elongating and becoming more divaricate in fruit; flowers perfect; corollas rotate, cream-color, glabrous, the apices obtuse; fruits dry, 1-1.25 mm. across, set with uncinat hairs.

The type collection is the only one known: near junction of Nebaj road with road between Sacapulas and Cunén at 6,700-7,300 ft. (2,168-2,362 m.), *Proctor 25139* (LL!, isotype IJ).

***Galium sphagnophilum* (Greenm.) Dempster var. *mazocarpum* (Greenm.) Dempster, Phytologia 26: 222. 1973. *R. mazocarpum* Greenm. Proc. Am. Acad. 41: 250. 1905.**

Growing interfingering with the mosses and other tiny plants in wet alpine meadows, and on moist banks near springs, 1,800-3,700 m. Huehuetenango; El Quiché. Mexico.

Tiny slender creeping perennial, rooting at the nodes; leaves and stems essentially glabrous, or sometimes with a few hairs; leaves 4 to a node, one-sixth to one-third as long as internodes, spindle-shaped or obovate, apparently 1-nerved, tapering to a long petiolar base and to the acute apex, tipped with a long hair; flowers usually solitary on short leafy lateral branches, which are largely included;

corollas rotate, hispid externally, greenish-white; fruits dry, tuberculate, the pedicels very short.

This seldom-collected species may actually be common in wet meadows and about springs. Since it is no larger than the moss with which it mingles, it is probably often overlooked by collectors. The var. *sphagnophilum*, which has not been collected in Guatemala, differs only in having smooth ovaries and fruits, and it may well be a mere trivial form. The three Guatemalan collections and three of the four Mexican collections seen, other than the type, have tuberculate fruits.

Galium uncinulatum DC. Prodr. 4: 600. 1830. *G. obstipum* Schlecht. Linnaea 9: 592. 1834.

Sierra Madre and mountains to the north, at 1,300-3,300 m. Hillsides, ravines, or among limestone rocks, in open mixed forest; Alta Verapaz; El Quiché; Huehuetenango; Totonicapán; Quezaltenango; San Marcos. Throughout Mexico, except in the lowlands, to Texas; Costa Rica; Panama.

Lax prostrate or procumbent plants, the herbaceous stems 20-60 (100) cm. long, many from a small rootcrown, often rooting at the nodes; stems and leaves more or less densely pubescent; leaves 4 to a node, 3-nerved, broadly elliptical or ovate-obovate to nearly orbicular, tapered to a more or less petiolar base, apiculate at apex, 8-12 (18) mm. long, one-fifth to one-half as long as the internodes; flowers borne on short bracteose few-flowered lateral branches, the branchlets and pedicels at maturity becoming elongated and widely divaricate, the pedicels often sharply bent below the fruit; ovaries with many uncinulate hairs about as long as carpel width; corollas greenish yellow to nearly white, commonly appearing no larger than the densely hairy ovary, usually hispid externally, more or less campanulate at base, the lobes not widely spreading; fruit dry or sometimes a little fleshy, the body 1.5-2 mm. wide, set with many uncinulate hairs.

This is a common and variable species, ranging from Panama to southern Texas and reappearing in Baja California.

GARDENIA Linnaeus

Shrubs or trees, glabrous or pubescent, generally unarmed, the branchlets terete; stipules intrapetiolar, triangular, acute or acuminate, often connate at the base; leaves opposite, membranaceous or coriaceous; flowers large, usually solitary and axillary, rarely terminal or corymbose, white or yellow; hypanthium ovoid or obconic; calyx tubular or spathaceous, lobed or parted, usually persistent; corolla salverform, campanulate, or funnellform, the tube much exceeding the calyx, the throat usually glabrous, the limb 5-9-lobate, the lobes spreading or recurved, short or elongate, contorted in bud; stamens 5-9, inserted in the corolla throat, the filaments very short or none; anthers sessile or subsessile, dorsifixed, linear-oblong, included or short-exserted; ovary 1-celled or rarely falsely 2-celled, the style stout, clavate or

fusiform at the apex; ovules numerous, horizontal, the placentae parietal; fruit oblong to ovoid or pyriform, terete or costate, coriaceous or fleshy and rupturing irregularly, or the endocarp 2-5-valvate and indurate; seeds very numerous, imbedded in pulp, horizontal, compressed or turgid, obtusely angulate.

A genus of 70 or more species, confined to the Old World tropics.

Gardenia augusta (L.) Merr. Interpr. Herb. Amboin. 485. 1917. *Varneria augusta* L. Amoen. Acad. 4: 136. 1759. *G. jasminoides* Ellis, Phil. Trans. 51, pt. 2: 935. 1761. *G. florida* L. Sp. Pl. ed. 2. 305. 1762. *Jazmín de cabo*; *jazmín*.

Cultivated commonly for ornament at low and middle elevations. Native of southern China, grown for ornament in most tropical regions, and in greenhouses in temperate countries.

A stout, densely branched shrub, usually 1-2 m. high, the branches scabrous-puberulent; stipules thin, brown, 1 cm. long or less; leaves coriaceous, short-petiolate, the blades obovate or oblong-obovate, mostly 5-7 cm. long, obtuse or acute, narrowed to the base, almost glabrous; flowers white, large and showy, very fragrant, double in cultivated forms; calyx lobes foliaceous, triangular-lanceolate, 2-2.5 cm. long.

The gardenia, a favorite flower in the florists' shops of the United States, is also highly esteemed in Central America, where it adorns the gardens of rich and poor. Gardenia perfume is well known, but, although originally obtained directly from the flowers, is probably now a synthetic product.

GENIPA Linnaeus

Unarmed, glabrous or pubescent trees, the branchlets terete; stipules intrapetiolar, elongate, deciduous; leaves opposite, usually large, petiolate or subsessile; inflorescence few-flowered, axillary or terminal cymes; flowers rather large, white or yellowish, pedicellate, hypanthium turbinate or campanulate, the calyx ampliate, truncate or 5-6-lobate, persistent; corolla salverform, the tube short or elongate, the throat pilose or glabrous, the limb 5-6-lobate, the spreading lobes obtuse or acute, contorted in bud, coriaceous; stamens 5-6, inserted at the top of the corolla tube, the anthers sessile, dorsifixed, linear, exserted; ovary 1-2-celled, the style thick, the stigma fusiform; ovules numerous, the placentae parietal; fruit baccate, subglobose, large, with thick pericarp; seeds numerous, large, compressed, with subfibrous testa.

A small genus of tropical America with several species in South America and four others recorded from Central America.

Corolla glabrous outside; leaves glabrous; stipules rounded at the apex.

G. vulcanicola.

Corolla densely sericeous outside; leaves softly pubescent beneath; stipules acuminate.....*G. caruto*.

Genipa caruto HBK. Nov. Gen. & Sp. 3: 407. 1820 *G. americana* var. *caruto* Schum. in Mart. Fl. Bras. 6, pt. 6: 352. 1889. *Irayol*; *jagua*; *gualí* (Quezaltenango); *arayol* (corruption of *irayol*); *tiñe-dientes* (fide Aguilar). Figure 30.

Common on the Pacific plains and in the lower hills of eastern Guatemala, ascending to about 900 m.; Chiquimula; Jutiapa; Santa Rosa; Quezaltenango; Huehuetenango; doubtless in several other departments. Southern Mexico; Honduras and El Salvador to Panama; northern South America.

A large tree, often 14 m. high, with thick trunk and broad spreading crown, the thick branchlets densely short-pilose or glabrate; stipules triangular, 1-2.5 cm. long, long-acuminate; petioles very thick, 1 cm. long or shorter, the leaf blades obovate to oblong, 15-35 cm. long, 6-19 cm. broad, acute or obtusely short-acuminate, attenuate to an acute base, herbaceous, lustrous above and glabrous or nearly so, densely short-pilose beneath; cymes short-pedunculate, lax or dense, 4-10 cm. long, the pedicels 4-10 mm. long; hypanthium and calyx densely short-pilose, the hypanthium 4-8 mm. long, the calyx 5-8 mm. long, truncate or shallowly crenate, sericeous within; corolla yellowish white, 2-4.5 cm. long, the tube glabrous near the base, sericeous above, the 5-6 lobes oblong, obtuse, longer than the tube, the throat villous; anthers 1.5-2.5 cm. long; fruit subglobose, 6-7 mm. in diameter, smooth or sparsely tuberculate, short-pilose or glabrate; seeds irregular, 6-12 mm. long, dark brown.

Called "guitil" in Costa Rica, but the usual names elsewhere in Central America are "jagua" or "irayol." In Chiapas the tree is said to be called "mamuc." The name "jagua" is believed to be of Antillean origin, and the specific name *caruto* is Venezuelan. *G. caruto* often is considered synonymous with *G. americana*, or a variety of it. *G. americana*, which in continental North America extends northward through Panama to Costa Rica, is glabrous almost throughout while *G. caruto* has abundant pubescence. The ranges of the two forms overlap in some regions but ordinarily the two are so distinct that it is at least convenient to treat *G. caruto* as a distinct species. The tree is a well known one in Central America. Its wood, valued for construction purposes, is strong, resistant, and flexible, in its properties somewhat resembling hickory (*Carya*) of the United States. The pulp of the fruit is edible, but it is little eaten except by children and domestic animals as it is dark and repulsive in appearance and not particularly pleasant in flavor. Its dark juice leaves an indelible stain upon any object that it touches. This juice, producing a dark blue or almost black color, was formerly used by many of the American aborigines for painting their bodies. In El Salvador it was much used as the source of a blue dye that is highly prized for coloring *rebozos* and other textiles. In Honduras the well-ripened fruit is the basis of an

agreeably flavored "wine" which is taken by invalids as a stimulant to the appetite and to digestion. It is claimed that if the fruit is eaten in sufficient quantity it expels intestinal parasites. The expressed juice of the young leaves is one of the numerous remedies for fevers employed by the country people of Honduras and other parts of Central America.

Genipa caruto is one of the common and conspicuous trees of the Pacific coast. It sheds its leaves in the middle of the dry season, but the trees are easily recognizable then because of their abundant large fruits, unlike those of any associated tree. The vernacular names appear as names for at least two Guatemalan settlements, the *caserío* of Irayol in Jutiapa and the *aldea* of Jagua in Chiquimula. The fruits are sometimes on sale in the Quezaltenango market, under the name "gualí." It is said that some of the Indians make it a practice to carry them in their hands under certain conditions, to ward off disease and other evils.

Genipa vulcanicola Standl. Field Mus. Bot. 17: 213. 1937. *Guayabillo cimarrón* (San Marcos); *cola de pavo*; *tinajo* (fide Aguilar).

Damp or wet, mixed, mountain forest, central and western departments, 1,300-2,100 m.; Guatemala; Suchitepéquez (type from Volcán de Atitlán, *Skutch 1512*); Sololá; Huehuetenango; Quezaltenango; San Marcos. Mexico (Chiapas).

A tree 15 m. high or less, the trunk about 30 cm. in diameter, glabrous almost throughout; stipules at first conspicuous but soon deciduous, oblong, rounded at the apex, 5 cm. long or less; petioles 1-2 cm. long, the blades elliptic to elliptic-oblong, mostly 10-23 cm. long and 4.5-11 cm. broad, acute or obtuse, acuminate to rounded at the base, barbate beneath in the nerve axils, the lateral nerves about 7 on each side; inflorescence sessile, about 4 cm. long and broad, few-flowered, the branches thick, sparsely hirtellous, the pedicels 1 cm. long or less; calyx broadly campanulate, 1 cm. long and broad, glabrous, truncate and remotely denticulate; corolla white, subcoriaceous, glabrous outside, the tube 1 cm. long, 4 mm. thick, the lobes rounded-ovate, broadly rounded at the apex, sparsely ciliate, glabrous within; anthers half exserted; fruit globose, 3 cm. in diameter or larger, crowned by the persistent calyx.

Recent collections show that the tree is rather common, especially in the coastal plain of Quezaltenango and San Marcos. Flowering specimens were collected in October, but during the dry season neither flowers nor fruits have been observed.

GEOPHILA D. Don

Reference: Louis O. Williams, *Geophila* in North America, *Phytologia* 26: 263. 1973.

Creeping perennial herbs, rooting at the nodes; stipules small, persistent and becoming somewhat indurate, shallowly bilobate; leaves small, long-petiolate, ovate-cordate or rounded-cordate, herbaceous, inconspicuously nerved; flowers very small, in terminal pedunculate few-flowered heads, the head subtended by 2 small free bracts; calyx dentate or lobate, persistent; corolla tubular-funnelform, white, pilose in the throat, the limb 4-7-lobate, the lobes spreading or recurved, valvate in bud; stamens 4-7, inserted in the corolla tube, the filaments filiform, the anthers dorsifixed, linear, half exserted; ovary 2-celled, the style slender, with 2 short branches; ovules solitary, erect from the base of the cell; fruit drupaceous, juicy, containing 2 one-seeded nutlets, these costate dorsally and slightly twisted.

About 20 species in tropical Asia, Africa, and America. One other species is known from Nicaragua and Panama. Several occur in South America.

Fruits black when mature; inflorescence originating from the primary stem or from a very short usually leafless secondary stem; pyrenes not ridged.....*G. macropoda*.

Fruits red or orange when mature; inflorescence usually from an elongated leaf-bearing secondary stem; pyrenes ridged.

Ovary, fruit and leaves pubescent.....*G. cordifolia*.

Ovary and fruits glabrous, leaves usually so.....*G. repens*.

Geophila cordifolia Miquel, Stirp. Surin. Sel. 176. 1850.

Mapouria trichogyne Muell.-Arg., Mart. Fl. Bras. 6(5): 426. 1881.

Geophila trichogyne Standl. Field Mus. Bot. 7: 423. 1931.

Izabal, near sea level, in wet forest. British Honduras (Temash River); Costa Rica; Colombia, Guianas to Venezuela, Amazonian Brazil, and eastern Peru.

Creeping and forming dense colonies, villous-hirsute throughout with long slender spreading hairs; leaves long-petiolate, the blades oblong-cordate to broadly ovate-cordate, 3-11 cm. long, 2.5-4.5 cm. broad, acute or acutish, deeply and narrowly cordate at the base, conspicuously paler beneath; peduncles usually shorter than the petioles, the dense heads 5-8-flowered, the linear bracts rather conspicuous; calyx lobes lance-linear, in fruit 4-5 mm. long; corolla white; fruit ovoid, about 4 mm. long, densely villous, red or orange-red, probably red at maturity.

Geophila macropoda (Ruiz & Pavón) DC. Prodr. 4: 537. 1830.

Psychotria macropoda Ruiz & Pavón, Fl. Peruv. 2: 63, t. 211, fig. b. 1799.

Wet thickets and forests, weed in banana plantations, at 600 m. or usually less; Petén; Izabal; Suchitepéquez; Escuintla. Mexico (Vera Cruz, Oaxaca; Puebla; Chiapas); El Salvador; Honduras; Costa Rica; Panama; Venezuela and Colombia south in the lowlands to Bolivia, Brazil, and Argentina (Misiones).

Small colonial repent or creeping herbs up to perhaps 1 m. long; the main stems rooting at the nodes, the internodes 5-12 cm. long, with short erect lateral branches

and erect leaves, the lateral branches almost none to about 2 cm. long, usually leafless but bearing a long pedunculate inflorescence at the apex; leaves 2 at the nodes, or sometimes only one, petioles slender, 3-14 cm. long, pubescent above near the leaf-blade, glabrescent below, leaf blades ovate-cordate to cordate, the apex obtuse or rounded, glabrous, with 4 secondary nerves (and the main nerve) from apex of petiole and 4 more above, (3-)5-9 cm. long and nearly as broad; inflorescence a long-pedunculate few-flowered head arising from a short secondary stem or from the primary stem, peduncle when mature about as long as the petioles, head subtended by 2 or 4 short narrowly triangular bracts; calyx about 2-3 mm. long, the lobes linear to linear-oblong, acute or obtuse, prominently nerved, about 1-2 mm. long; corolla white, early deciduous; fruits fleshy, shining black.

Commonly identified with *G. repens* but easily distinguished by the black, not red, fruits, the inflorescence borne from the primary stem or a short usually leafless secondary stem, not from an elongated secondary stem. The cordate base of the leaf usually has somewhat divaricate basal lobes not closed or sometimes overlapping ones.

Geophila repens (L.) I. M. Johnston, *Sargentia* 8: 281. 1949; *Rondeletia repens* L. Syst. 928. 1759. *Psychotria herbacea* Jacq. Enum. Pl. Carib. 16. 1760. *Geophila reniformis* D. Don, Prodr. Fl. Nep. 136. 1825. *G. herbacea* Schum. in Engler & Prantl, Pflanzenf. IV. 4: 119. 1891. *Geocardia herbacea* Standl. Contr. U. S. Nat. Herb. 17: 445. 1914.

Wet thickets and forests of the hot lowlands of both coasts at 700 m. or less, often a weed in banana plantations; Petén; Alta Verapaz; Izabal; Santa Rosa; Escuintla; Suchitepéquez. Southern Mexico to Panama, and through most of tropical South America.

Plants creeping and often forming dense close colonies in shaded places; stipules about 1.5 mm. long; petioles slender, mostly 6-12 cm. long; leaf blades rounded-ovate to subreniform, mostly 3-5.5 cm. long, deeply cordate at the base, almost glabrous but often slightly puberulent; peduncles long and slender, the heads 3-5-flowered; calyx lobes green, linear-lanceolate, acuminate; corolla white or sometimes purplish, often 1 cm. long; fruit becoming red, about 5 mm. long, with scant pulp.

Sometimes called "hierba de culebra" in Honduras.

GONZALAGUNIA West

Shrubs or small trees, more or less pubescent, with slender terete branches; stipules small, interpetiolar; leaves opposite, petiolate or subsessile, mostly herbaceous; flowers small, sessile or pedicellate, white or pink, arranged in slender elongate terminal spikes or thyrsiform panicles; hypanthium globose or campanulate; calyx normally 4-lobate, the lobes small, often green, equal or unequal, persistent; corolla funnelform or salverform, the tube short or elongate, the throat ampliate or contracted, villous, the limb 4-lobate, the lobes short, spreading, obtuse, valvate or

imbricate in bud; stamens 4, inserted in the corolla tube, the filaments short; anthers dorsifixed, linear-oblong, included; ovary 2- or 4-celled, the style filiform, the small stigma obtuse or 2- or 4-lobate, included or exserted; ovules numerous, the placentae peltately affixed to the septum; fruit *baccate*, usually somewhat depressed-globose, 2-4-sulcate, 2-4-celled, many-seeded; seeds minute, subglobose, the testa deeply foveolate.

About 15 species in tropical America, 11 known from Central America. In general appearance the plants simulate certain species of *Rondeletia* (which have capsular fruits), and if fruits are not present, often it is difficult to tell which genus is represented by a flowering specimen.

Young branches appressed-pilose; corolla tube about 1 mm. thick in the throat.

G. panamensis.

Young branches pilose or hirsute with long spreading hairs; corolla tube 2-3 mm. thick in the throat.

Leaves densely covered beneath with long and very slender, matted hairs.

G. chiapasensis.

Leaves glabrate beneath except on the veins, there puberulent or pilosulous with very short hairs.

Petioles 5-8 mm. long, hirsute; corolla sparsely appressed-pilose outside, the lobes almost half as long as the tube*G. thyrsoides.*

Petioles 10-20 mm. long, glabrate; corolla sparsely and minutely strigillose or almost glabrous, the lobes much less than half as long as the tube..*G. rojasii.*

Gonzalagunia chiapasensis (Standl.) Standl. & Steyerf.

Field Mus. Bot. 22: 283. 1940. *Rondeletia chiapasensis* Standl. Field Mus. Bot. 22: 54. 1940.

Mountain forests or second-growth thickets of the western highlands, 1,600-2,500 m.; Quezaltenango; San Marcos. Mexico (Chiapas, the type from Cascarada).

A shrub or small tree 4.5-6 m. high, the branches densely pilose with long soft spreading hairs; stipules subulate-attenuate from a triangular base, 6-7 mm. long; leaves on petioles 5-15 mm. long, narrowly oblong-lanceolate, 10-23 cm. long, 3-6 cm. broad, narrowly attenuate-acuminate, acute at the base, densely pilose above with long or short, spreading or somewhat appressed hairs, very densely pilose beneath with very long and slender, matted and interlaced hairs, the lateral nerves about 10 on each side; inflorescence spiciform, 7.5-23 cm. long, about 2 cm. broad, pedunculate, erect or recurved, the stout rachis densely short-pilose, the flowers in dense sessile cymes; hypanthium and calyx densely spreading-pilose, the calyx lobes lance-oblong, erect, acute; corolla rose outside, white within, densely strigose outside, the tube about 10 mm. long, dilated upward and 2 mm. broad or more, the rounded lobes 3 mm. long; fruit white, tinged with rose at the apex, globose, 6 mm. in diameter, apparently very fleshy.

Gonzalagunia panamensis (Cav.) Schum. in Martius, Fl.

Bras. 6, pt. 6: 292. 1889. *Buena panamensis* Cav. Anal. Hist. Nat. 2:

279. 1800. *Gonzalea panamensis* Spreng. Syst. Veg. 1: 417. 1825. *Duggena panamensis* Standl. Contr. U. S. Nat. Herb. 18: 126. 1916.

Warmer regions and plains of both coasts, usually at 900 m. or less, but ascending on the slopes of Santa María and Tajumulco to about 1,500 m., mostly in damp thickets or moist hillside forest, sometimes on dry slopes. Petén; Alta Verapaz (Pancajché); Baja Verapaz (Panzal); Izabal; Escuintla; Santa Rosa; San Marcos. British Honduras. Southern Mexico to Panama (type from Cerro de Ancón) and Colombia; Cuba.

A slender shrub 3 m. high or less, the branches brownish, densely sericeous or strigose when young; stipules triangular, subulate-acuminate, 3-8 mm. long; petioles mostly 1-2 cm. long, often shorter, the blades ovate to lanceolate, 7-14 cm. long, 2-6 cm. broad, gradually or abruptly acuminate or long-acuminate, acute or obtuse at the base, green above, densely or sparsely strigillose or glabrate, sparsely or densely appressed-pilose beneath or glabrate, the lateral nerves 5-9 on each side; inflorescence spiciform, 8-20 cm. long, short-pedunculate, the cymules sessile or subsessile, the pedicels 2 mm. long or shorter; calyx and hypanthium 1.5-2 mm. long, strigillose or short-pilose, the calyx lobes deltoid, obtuse or acute; corolla white, 10-17 mm. long, the very slender tube glabrous or sparsely appressed-pilose, the lobes 2-2.5 mm. long, sparsely tomentose within; stamens included; fruit black at maturity, juicy, globose, 4-coccous (as in the other Guatemalan species), 3-4 mm. in diameter; seeds dark reddish brown.

Gonzalagunia rojasii Standl. Field Mus. Bot. 22: 114. 1940. *Chichipín*; *cachito de venado* (Quezaltenango); *casahuach* (Patzulín); *rugey-risis* (fide Aguilar).

Moist or wet, mixed, mountain forest, 1,200-1,500 m.; endemic; Escuintla; Guatemala; Quiché; Quezaltenango (type collected below El Muro, below Santa María de Jesús, *Standley 67145*).

A shrub or small tree 3-9 m. high, the branchlets stout, at first densely pilose with very long, soft, spreading, pale hairs; stipules 8 mm. long, acuminate from a triangular base; petioles 1-2 cm. long, hispid, the blades elliptic or obovate-elliptic to oblong-lanceolate, 11-20 cm. long, 5-9 cm. broad, acute or short-acuminate, acute at the base or gradually narrowed and decurrent, green above, sparsely hispidulous or glabrate, beneath appressed-pilosulous with short hairs on the veins and nerves, the lateral nerves about 9 on each side; inflorescence spikelike, pedunculate, 15-20 cm. long, the cymules sessile, the rachis stout, hispid; hypanthium rounded at the base, 1.5 mm. long, almost glabrous; calyx 1 mm. high, remotely 4-dentate, glabrous; corolla pale greenish yellow or pinkish, sparsely and very minutely strigillose outside or almost glabrous, the slender tube 6-14 mm. long, the lobes ovate-rounded, 2.5 mm. long; fruit 4-celled, depressed-globose, 4-5 mm. broad, pink or red.

It is now somewhat questionable whether this is distinct from *G. thyrsoides*. The isolated occurrence of *G. thyrsoides* would lead one to suppose that two distinct species are involved.

Gonzalagunia thyrsoidea (Donn.-Sm.) Robinson, Proc. Am. Acad. 45: 405. 1910. *Gonzalea thyrsoidea* Donn.-Sm. Bot. Gaz. 13: 188. 1888. *Duggena thyrsoidea* Standl. Contr. U. S. Nat. Herb. 18: 126. 1916. Figure 23.

Moist or wet, mixed, mountain forest or thickets, 800-1,500 m.; endemic; Alta Verapaz (type from Pansamalá, *Tuerckheim* 1249); Huehuetenango.

A shrub or small tree of 3-6 m., the branches stout, hirsute; stipules deltoid-acuminate, 6-7 mm. long; petioles stout, 5-8 mm. long, hirsute, the blades elliptic or elliptic-oblong, 20-23 cm. long, acuminate at each end, lustrous above and sparsely pilose, pilose beneath along the veins; inflorescence about 30 cm. long, the flowers pedicellate, in 3-7-flowered subsessile cymes; calyx lobes triangular, unequal; corolla sparsely appressed-pilose outside, white tinged with pink, the tube 14 mm. long, 3 mm. broad in the throat, the lobes nearly half as long, farinaceous and arachnoid within; anthers subexserted; ovary 4-celled; fruit depressed-globose, about 8 mm. in diameter, red.

GUETTARDA Linnaeus

Unarmed trees or shrubs; stipules intrapetiolar, deciduous; leaves opposite or ternate, petiolate or subsessile, membranaceous to rigid-coriaceous; flowers rather large or small, bracteolate or ebracteolate, arranged in axillary, bifurcate or congested cymes or sometimes solitary, usually secund and perfect; hypanthium ovoid or globose; calyx tubular, cupular, or campanulate, truncate or very obscurely 2-9-dentate, deciduous; corolla funnelform or salverform, usually white or pink, the tube elongate, with naked throat, the limb 4-9-lobate, the obtuse lobes imbricate in bud, 2 of them exterior; stamens 4-9, inserted in the corolla tube, the filaments very short or none, the anthers linear, dorsifixed, included; ovary commonly 2-9-celled, the cells tubular, elongate, the style filiform, the stigma capitate or shallowly bilobate; ovules solitary, pendulous from the apex of the cell; fruit drupaceous, globose to ovoid or oblong, sometimes acutely angulate, the flesh very thin, the stone ligneous or osseous, 2-9-celled, the cells straight or recurved; seeds pendulous.

The genus *Guettarda* is one of the larger genera of the Rubiaceae and one which has received no critical study since Standley's account of it for the *North American Flora* (32: 228-262. 1934). Some 30 species have been described from Mexico, Central America, and Panama, or credited to the region. The total from all North America is about 100 species. The genus is also found in South America.

Fruit acutely 4-angulate; young branches hirsute with long ascending hairs.

G. cobanensis.

Fruit terete; young branches not long-hirsute.

Tube of the corolla pilose with appressed hairs that are directed downward; leaves mostly 7-14 cm. broad.....*G. combsii*.

Tube of the corolla pilose with hairs that are directed upward; leaves much smaller.

Pubescence of the lower leaf surfaces of spreading hairs.

Leaves acute or subacute.....*G. gaumeri*.

Leaves rounded or very obtuse at the apex.....*G. deamii*.

Pubescence of the lower leaf surface of very closely appressed hairs.

Corolla tube 6-9 mm. long; fruit 4-8 mm. in diameter.....*G. elliptica*.

Corolla tube about 12 mm. long; fruit 10-15 mm. in diameter.

G. macrosperma.

also.....*G. petenensis* and *G. tikalana*.

Guettarda cobanensis Donn.-Sm. Bot. Gaz. 47: 255. 1909.

Alta Verapaz (type collected in mountain forest near Cobán, 1,500 m., *Tuerckheim II.2096*); collected also at Chicoj northeast of Carchá, 1,200 m., in wet thicket; and near Tactic; endemic.

A shrub 2.5 m. high, or perhaps becoming larger, the branchlets obtusely tetragonous, densely fulvous-pilose with long ascending hairs; stipules ovate, 1-1.5 cm. long, attenuate, thin, brown, fulvous-pilose near the base and along the costa; leaves mostly ternate, the slender petioles 2-4.5 cm. long, hirsute; leaf blades elliptic or elliptic-ovate, 9-21 cm. long, 3-10 cm. broad, acute or acuminate at base and apex, green above and short-pilose, especially along the nerves, appressed-pilose beneath, the lateral nerves about 11 on each side; peduncles 1.5-2 cm. long, the cymes bifurcate, with branches 1-1.5 cm. long and 3-4-flowered; flowers 4-5-parted, the bractlets minute; calyx and hypanthium 2 mm. long, puberulent, the calyx short, shallowly dentate; corolla tube 22 mm. long, retrorse-pilose outside, the lobes lacerate-crispate, one-third as long as the tube; anthers 4 mm. long; fruit acutely quadrangular, 9 mm. long, 5-7 mm. thick, 3-4-celled, the cells straight.

Apparently a rare plant, since recently it has been collected but twice.

Guettarda combsii Urban, Symb. Antill. 6: 48. 1909. *G. scabra* var. *seleriana* Loes. Repert. Sp. Nov. 18: 361. 1922. *G. seleriana* Standl. Contr. U. S. Nat. Herb. 23: 1384. 1926. *Texpac, textop* (Petén, Maya, fide Lundell).

Dense or open, wet or dry forest, 900 m. or lower, usually on limestone; often at edges of clearings, sometimes in second growth; Petén; Alta Verapaz; Izabal. Mexico (Chiapas, Tabasco, and Yucatan); British Honduras; Honduras; Nicaragua; Cuba.

A tree, said to attain sometimes a height of 18 m. but usually much smaller and often only a shrub, the trunk reported to attain a diameter of 60 cm., the young branchlets terete, ferruginous-pilosulous with ascending or spreading hairs; stipules mostly oblong or lanceolate and 8-14 mm. long, filiform-acuminate, pilose outside; leaves opposite, on slender petioles 1-6 cm. long, very variable in shape, rounded-oval to oval, rounded-ovate, or broadly oval-obovate, 7-20 cm. long, 5-13 cm. broad, rounded and very abruptly short-acuminate at the apex or obtuse or acutish, rounded to deeply and narrowly cordate at the base, chartaceous or subcoriaceous, green

above, glabrous or pilosulous on the veins, paler beneath or sometimes green, usually densely and minutely pilosulous with mostly somewhat spreading hairs, the lateral nerves 8-11 on each side; cymes once or twice bifid, on slender peduncles 5-15 mm. long, the branches 1-5 cm. long, bearing 5 to many flowers; bractlets linear, 3-5 mm. long; corolla white or creamy white, the tube 16-18 mm. long, densely retrorse-pilose, the 6-7 lobes one-fourth to one-third as long as the tube; ovary 4-5-celled; fruit globose, 6-8 mm. in diameter, densely and minutely tomentose.

The Maya name "xtez-tab" is reported from Yucatan. In British Honduras the tree is called "glassy wood."

Guettarda deamii Standl. Contr. U. S. Nat. Herb. 20: 209. 1919. *Fruta de mico* (fide Aguilar).

Dry thickets, mountain sides or along arroyos, at about 500 m. or less or apparently ascending to about 1,500 m. in central Guatemala; Zacapa (type from Gualán, *Deam* 6271); Chiquimula (Quebrada Shusho, above Chiquimula); Guatemala (probably vicinity of La Aurora, or perhaps at a lower elevation). Honduras.

A shrub or small tree 3-5 m. high, the older branches dark and lenticellate, the young branchlets densely short-pilose; stipules ovate-oblong, 3-4 mm. long, obtuse or subacute; leaves opposite, on petioles 5-9 mm. long, mostly oval, sometimes oval-oblong or obovate-oval, 4-9 cm. long, 2.5-6.5 cm. broad, usually broadly rounded at the apex, varying to subacute, rounded at the base, densely short-pilose or pilose-scaberulous above, densely velutinous-pilosulous beneath, the lateral nerves 8-10 on each side; cymes subcapitate, 3-5-flowered, the very stout peduncles 3-10 mm. long, the bractlets subulate, 3-4 mm. long; hypanthium and calyx densely appressed-pilose, the calyx truncate; corolla white, the tube densely antrorse-pilose, about 7 mm. long, the broad lobes half as long as the tube; fruit globose, 8 mm. in diameter, 3-4-celled, densely and minutely tomentulose.

Guettarda elliptica Swartz, Prodr. Veg. Ind. Occ. 59. 1788.

In forest or thickets, near sea level; Alta Verapaz; Petén (La Libertad, *Lundell* 3329). Northern British Honduras and in Tabasco; southern Florida; West Indies; southern Mexico; Venezuela.

A shrub or small tree, sometimes 8 m. high but usually lower, reported as sometimes more or less scandent, the slender branches terete, often with conspicuous white lenticels, appressed-pilose, leafy at the ends; stipules deltoid-acuminate, 3 mm. long; leaves opposite, on stout petioles 12 mm. long or less, usually oval or rounded-oval, mostly 3-7.5 cm. long and 1-4.5 cm. broad, commonly rounded or obtuse and apiculate at the apex, sometimes acute or short-acuminate, truncate to acute at the base, membranaceous or chartaceous, green above, sparsely and minutely appressed-pilose or glabrate, minutely appressed-pilose beneath or glabrate, the lateral nerves 5-7 on each side; cymes axillary, dense, 1-9-flowered, usually 3-flowered, the peduncles 0.5-3 cm. long; bractlets minute or sometimes equaling the calyx; calyx and hypanthium minutely tomentulose and often short-pilose; calyx 2-2.5 mm. long,

truncate; corolla white, tinged with pink outside, the tube antrorse-sericeous, the slender tube 6-9 mm. long, the 4 lobes rounded-obovate, 2-2.5 mm. long; fruit globose, 4-8 mm. in diameter, purplish when mature, 2-4-celled.

Called "prickle wood" in British Honduras, and the Maya name is reported as "kiikché."

Guettarda gaumeri Standl. Field Mus. Bot. 8: 58. 1930. *Zedi* (Petén, fide Lundell).

Moist forest or thickets, 200 m. or lower; Petén; Izabal. Mexico (Yucatan and Campeche) to northern British Honduras, the type from Yucatan.

A shrub about 3 m. high or sometimes a tree of 7 m., the branches terete, the young branchlets densely short-pilose with spreading hairs; stipules broadly ovate, obtuse, brown and sparsely sericeous within; leaves opposite, on petioles about 4 mm. long, oblong or oblong-elliptic, 3-7.5 cm. long, 1-4 cm. broad, acute or obtuse and apiculate, obtuse to broadly rounded or even obscurely cordate at the base, usually densely velutinous-pilose above, densely pilose beneath with spreading and often matted hairs, the lateral nerves about 8 on each side; cymes subcapitate, mostly 3-flowered, the stout peduncles 4-8 mm. long; bracts lanceolate or ovate, 3-4 mm. long; hypanthium and calyx densely pilose with long ascending hairs, the calyx shallowly bilobate; corolla white, 12 mm. long, densely pilose with long ascending hairs, the lobes 2 mm. long, glabrous within; fruit oval, 5 mm. long, densely tomentose and sparsely long-pilose, 4-celled.

Guettarda macrosperma Donn.-Sm. Bot. Gaz. 18: 204. 1893. *Crucito*. Figure 37.

Dry or moist thickets, sometimes in forest, chiefly at 900 m. or less, but perhaps ascending to about 1,500 m.; Petén; Izabal; Chiquimula (?); Santa Rosa (type from Santa Rosa at 900 m., *Heyde & Lux 3160*); Escuintla; Suchitepéquez; Sololá; Retalhuleu. British Honduras to Panama.

A rather slender shrub or a small tree, sometimes 8 m. high, the trunk as much as 10 cm. in diameter, the young branchlets fulvous-pilose with short, mostly appressed hairs; stipules ovate-deltoid, 4 mm. long, filiform-acuminate; leaves opposite, on petioles 0.5-2.5 cm. long, oval to oval-elliptic, rhombic-elliptic, or oblong, 5-13 cm. long, 2.5-7 cm. broad, subacute to acuminate, rounded to subacute at the base, membranaceous or chartaceous, green above, hispidulous when young with setiform hairs, glabrate in age, minutely appressed-pilose beneath, the lateral nerves 7-9 on each side; cymes few-flowered, at first dense, the branches in fruit as much as 2 cm. long, the peduncles 1-5 cm. long; bractlets subulate, shorter than the calyx; calyx and hypanthium tomentulose, the calyx 2-2.5 mm. long, truncate; corolla white or creamy white, sericeous outside, the tube 12 mm. long, the 5-6 lobes oval, one-third as long as the tube; fruit globose, 1-1.5 cm. in diameter, often dark red, densely and finely tomentulose, 3-4-celled.

The name "correa" is reported from Honduras; "tintero" (El Salvador). The material of this and some of the other species now at hand from Guatemala is scant and in poor condition. When more and better specimens have accumulated, it is probable that a realignment of the species will be necessary.

Guettarda petenensis Lundell, *Wrightia* 4: 124. 1969.

Tree in forest, in lowland Petén, *Contreras* 6947.

Said to be a tree to 20 m. and 60 cm. in diameter but probably much smaller, the branchlets substrigose, becoming glabrous; leaves at the end of new growths, petioles about 1 cm. long, the blades ovate or ovate-lanceolate, acuminate, 3-7.5 cm. long and 1.5-4.5 cm. broad, sparsely strigillose, to almost glabrous, barbellate in nerve axils below; inflorescence short, to 5 cm. long, probably few-flowered, peduncle prominently appressed-strigillose; fruit sessile or nearly so, said by collector to be carmen-red, oblong-elliptic, up to 2 cm. long.

This species is maintained, for the type is inadequate but does have smaller leaves than most *G. macrosperma*, of which it may be a synonym.

Guettarda tikalana Lundell, *Wrightia* 2: 63. 1960.

Known only from the type, near Tikal, Petén, *Lundell* 16519.

Woody vines, branchlets densely hirsute; stipules acuminate, 6-7 mm. long, deciduous; leaves membranaceous, obovate or obovate-elliptic, 8-16 cm. long, 4-8.5 cm. broad, acute or short-acuminate, the base narrowed, rounded or obtuse, densely pilose on the lower surface, pubescence on the upper surface primarily along costa and veins, lateral nerves 8-12 pairs; petioles hirsute, 7-12 mm. long; inflorescence of axillary or terminal cymes, hirsute, the branches as much as 2.5 cm. long; fruits sessile, finely tomentulose, conic or obovoid-conic, when immature up to 2.8 cm. long and 1.5 cm. in diameter.

We have seen specimens of this species which was described from fruiting material. The scandent habit is unusual in the genus. However, it cannot be separated in the key from *G. macrosperma* by the characters available.

HAMELIA Jacquin

Shrubs or trees, glabrous or pubescent; stipules interpetiolar, deciduous; leaves opposite or often verticillate, petiolate, herbaceous; flowers yellow or red, small or rather large, arranged in mostly terminal and scorpioid cymes, sessile or pedicellate, the bracts minute; hypanthium ovoid or turbinate; calyx 5-lobate, the lobes short or elongate, persistent; corolla tubular or funnellform, the tube 5-costate, constricted at the base, the throat glabrous, the limb 5-lobate, the lobes short, imbricate in bud, 1 or 2 of them exterior; stamens 5, inserted at the base of the corolla tube, the filaments short; anthers linear, basifixed, included or subexserted, the connective appendaged

at the apex; ovary 5-celled, the style filiform, the stigma fusiform; ovules numerous, the placentae affixed to the axis of the ovary; fruit small, baccate, ovoid to cylindric, 5-celled; seeds numerous, minute, angulate, the testa membranaceous, foveolate.

A genus of about 30 species in tropical America. Several others are known from Central America, and a few additional ones occur in Mexico.

Calyx lobes oblong to subulate, conspicuously longer than broad.

Corolla 1-1.5 cm. long, yellow, glabrous; leaves opposite.....*H. axillaris*.

Corolla 1.8-2.5 cm. long; glabrous or villous, yellow or red; leaves mostly verticillate.

Corolla villous; leaves villous beneath*H. rovirosae*.

Corolla glabrous or very minutely puberulent; leaves glabrate, merely puberulent beneath on the veins*H. calycosa*.

Calyx lobes deltoid or broadly deltoid, as broad as long.

Leaves opposite, glabrous or nearly so.

Leaves barbate beneath in the axils of the nerves.....*H. barbata*.

Leaves not barbate beneath.....*H. longipes*.

Leaves in whorls of 3-4, conspicuously pubescent and often densely so.

Plant conspicuously pubescent and often densely so.....*H. patens*.

Plant glabrous or glabrescent*H. patens* var. *glabra*.

Hamelia axillaris Swartz, Prodr. Veg. Ind. Occ. 46. 1788. *H. lutea* Rohr ex Smith in Rees, Cycl. 17: no. 4. 1811. *Chichipín amarillo* (fide Aguilar).

Moist or wet, usually mixed forest, 1,500 m. or lower; Suchitepéquez. Mexico; British Honduras, along the Atlantic slope to Panama; southward to Peru and Brazil; West Indies.

A low weak shrub or a small tree, rarely 6-9 m. high, the branches glabrous or when young minutely and inconspicuously puberulent; stipules deltoid, acuminate or cuspidate, 2-6 mm. long; leaves opposite, on slender petioles 0.6-4 cm. long, elliptic-oval to obovate-oval or oblong-elliptic, 5-18 cm. long, 2-7 cm. broad, cuspidate-acuminate or long-acuminate, acute or abruptly short-acuminate at the base, glabrous above, minutely puberulent beneath on the veins or glabrous; inflorescence terminal, few- or many-flowered, lax, pedunculate, the puberulent branches short or elongate, the flowers sessile or subsessile, secund; calyx and hypanthium 3 mm. long, minutely puberulent or glabrate, the calyx lobes oblong or linear-oblong, obtuse, minute, in fruit recurved and sometimes 1.5 mm. long; corolla yellow, 1-1.5 cm. long, glabrous or nearly so, constricted at the base, tubular-campanulate above and 3-4 mm. broad, the rounded lobes 1-1.5 mm. long; fruit globose-ellipsoid, 5-6 mm. long.

This shrub grows most often in deep forest. The inflorescences usually are few and not at all conspicuous. Rare in Guatemala.

Hamelia barbata Standl. Field Mus. Bot. 22: 115. 1940. *Chichipín*. Figure 34.

Chiefly in wet mixed forest, 500-1,500 m.; Escuintla (type from Finca Monterrey, slopes of Volcán de Fuego, *Standley 64569*); Guatemala; Chimaltenango; Suchitepéquez; Quiché; Quezaltenango; San Marcos. Mexico (Chiapas).

A shrub or small tree 3-8 m. high, the branchlets glabrous; stipules triangular-acuminate, 3-4 mm. long; leaves opposite, on petioles 1.5-2.5 cm. long, oblong-ob lanceolate or oblong-elliptic, 14-20 cm. long, 4.5-6 cm. broad, narrowly long-acuminate, narrowed to the acute or acuminate base, glabrous above, densely barbate beneath in the nerve axils but otherwise glabrous; inflorescence terminal, cymose-corymbose, short-pendunculate, laxly many-flowered, about 4.5 cm. high and 7 cm. broad, the flowers secund, glabrous, the slender pedicels 2-3 mm. long or in fruit more elongate; hypanthium oblong-turbinate, 3 mm. long, the calyx lobes scarcely more than 0.5 mm. long; corolla orange, tubular or slightly dilated above and as much as 5 mm. broad, about 18 mm. long, the very broad lobes 2 mm. long.

A rather showy and handsome plant.

Hamelia calycosa Donn.-Sm. Bot. Gaz. 12: 132. 1887. *H. chiapensis* Brandegee, Univ. Calif. Publ. Bot. 6: 71. 1914 (type from Finca Mexiquito, Chiapas).

Izabal; Alta Verapaz (the type from Pansamalá, *Tuerckheim 454*); Huehuetenango. Mexico (Oaxaca to Chiapas) and British Honduras; Honduras.

A shrub or tree, reported to reach a height of 12 m. in British Honduras, with trunk diameter of 25 cm., but this probably a great exaggeration, the branchlets glabrous or when young minutely puberulent; leaves mostly ternate, on petioles 4-12 mm. long, elliptic to oblong-ob lanceolate, 6-8.5 cm. long, 1.5-3.5 cm. broad, acuminate, acute or acuminate at the base, glabrous above, glabrous beneath or minutely puberulent along the veins; inflorescence terminal, usually few-flowered and lax, the flowers not secund or obscurely so, the pedicels 7 mm. long or less; calyx and hypanthium glabrous or sparsely puberulent, the hypanthium 3-4 mm. long, the calyx lobes oblong or oblanceolate, 2.5-6 mm. long, foliaceous, obtuse, recurved; corolla yellow or deep yellow, 18-22 mm. long, glabrous or minutely puberulent, constricted at the base, narrowly campanulate above, the throat 8 mm. broad, the semiorbicular lobes 2-2.5 mm. long; fruit oblong or cylindric, 7-12 mm. long, 4-6 mm. thick, glabrous.

From Oaxaca the names "cihuapate," "panelilla," and "clavo" are reported. The bark is dark brown, the inner bark pale pink. The wood is yellow.

Hamelia longipes Standl. Proc. Biol. Soc. Wash. 37: 53. 1924.

Dense wet mixed lowland forest, 150 m. or lower; Izabal (type from Escoba across the bay from Puerto Barrios, *Standley 24829*). Mexico (?); Atlantic coast of Honduras.

A shrub or small tree, glabrous throughout, 2-6 m. high; stipules deltoid-acuminate, 3-4 mm. long; leaves opposite, on slender petioles 2.5-3.5 cm. long, oval to oblong-elliptic, 15-25 cm. long, 7-11 cm. broad, acute or rather abruptly short-acuminate, rounded to acute at the base; inflorescence terminal, cymose-corymbose, on a long or short peduncle, sometimes 12 cm. long and 20 cm. broad, the rachis and pedicels bright red, the flowers not or scarcely secund, the slender pedicels 6-13 mm. long; calyx and hypanthium 3 mm. long, the calyx lobes almost obsolete, short and broadly rounded; corolla pale buff or pale yellow, 16-17 mm. long, tubular, very slightly ampliate above, the very short lobes ovate-deltoid, erect; fruit red, turning black at maturity, oblong-ovoid, about 7 mm. long and 4.5 mm. broad.

The local names "uva de montaña" and "coloradillo" are reported from Honduras.

Hamelia patens Jacq. Enum. Pl. Carib. 16. 1760. *H. erecta* Jacq. l.c. *Hierba del cáncer* (Escuintla); *chichipín*; *cuetillo* (*cohetillo?*); *chac-ixcanan*, *xcanan*, *ixcanan*, *ixcanan amarillo* (Petén, Maya, fide Lundell); *chamah*, *sicunken* (Quechí, fide Pittier); *sisipince*, *clavito*, *flor de cangrejo* (reported from Guatemala but not verified by the authors); *canuto*; *hierba de erisipela*.

Usually in dry to wet thickets, often in second growth, sometimes in rather open forest, 1,000 m. or lower; Petén; Alta Verapaz; Izabal; Zacapa; Chiquimula; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu; Quezaltenango; San Marcos; Huehuetenango; Quiché. Southern Florida; southern Mexico; British Honduras to El Salvador and Panama; southward to Bolivia and Paraguay; West Indies.

A shrub or small tree, commonly 1-3 m. high, the branches brown or grayish, villous or puberulent when young; stipules 3-6 mm. long, triangular-acuminate; leaves mostly ternate, on slender petioles 1-5 cm. long, lance-oblong to elliptic or ovate, 6-20 cm. long, 2-9 cm. broad, usually short-acuminate, rounded to acuminate at the base, puberulent or villosulous above, usually copiously villosulous beneath or tomentose; inflorescence terminal, many-flowered, the branches often much elongate in fruit, the flowers secund, sessile or nearly so; calyx and hypanthium 2.5-3 mm. long, sparsely or densely pubescent or villosulous, the calyx lobes minute, deltoid; corolla tubular, orange-red, 1.5-2 cm. long, sparsely or densely puberulent, villosulous, or farinose-puberulent, the lobes minute, erect; fruit globose or oblong-ellipsoid, 6-10 mm. long, 4-6 mm. thick, villosulous or puberulent, red, turning almost black; seeds brown or yellowish brown.

Known in El Salvador by the names "chichipince," "sisipince," "chichipinte," and "coralillo"; "coral" (Honduras); in Oaxaca called "canutillo"; called "coloradillo" and "achiotillo colorado" in Honduras. The Maya names are reported as "xcanan" or "xcanal," "neanan," and "chactoc" (Yucatan and British Honduras).

Although a decidedly weedy shrub, often occurring in great abundance along roads, in hedges, and in waste places, *Hamelia patens* is rather handsome when in full flower and not too dusty. In Guatemala it sometimes is planted for ornament in parks or gardens of the highlands where it does not grow naturally, as at Huehuetenango. The fruits are rather sweet and edible. The plant finds some use in domestic medicine.

This is one of the first shrubs to appear after clearings have been made in the forest but it rarely becomes abundant in such places.

Hamelia patens Jacq. var ***glabra*** Oersted, Vidensk. Meddel. Kjoenh. 1852: 42. 1853. *H. nodosa* Mart. & Gal. Bull. Acad. Brux. 11(1): 234. 1844.

In wet forests and thickets, Mexico to Panama and northern South America, to be expected in Guatemala but not yet known in the country.

Similar to the species but glabrate or glabrous.

Hamelia rovirosae Wernham, Journ. Bot. 49: 211. 1911. *H. patens* var. *coronata* Donn.-Sm. Bot. Gaz. 40: 4. 1905 (type from Cubilgüitz, Alta Verapaz, 350 m., *Tuerckheim* 8532). *H. purpurascens* Blake, Contr. Gray Herb. 52: 105. 1917 (type from Manatee Lagoon, British Honduras).

Wet forest or thickets of the Atlantic lowlands, 350 m. or less; Petén; Alta Verapaz; Izabal. Tabasco to Panama.

A shrub or small tree, 8 m. high or less, rarely subscandent, the branchlets sparsely or densely villous; stipules deltoid, with subulate tip, 3-5 mm. long; leaves ternate, on slender petioles 1.5 cm. long or less, elliptic, elliptic-oblong, or oval-elliptic, 5-15 cm. long, 2-5 cm. broad, acute or short-acuminate, acute or acuminate at the base, glabrous or sparsely villous above and minutely papillose, sparsely or densely villous beneath along the nerves; inflorescence terminal, with few or many flowers, short-pedunculate, lax, the branches short or elongate, the flowers sessile or short-pedicellate, usually secund; calyx and hypanthium sparsely or densely villous with crisped hairs, the hypanthium 3 mm. long; calyx lobes narrowly oblong, obtuse, 2-5 mm. long, reflexed; corolla 18-24 mm. long, dull or dark red, villous, cylindric below, gradually ampliate upward, 6 mm. broad in the throat, the rounded lobes 1.5-2 mm. long; fruit ovoid, 8 mm. long, red or purple, sparsely or densely villous.

The crisped or flattened hairs of the inflorescence and new growths along with the narrow calyx lobes facilitate the determination of this species.

Called "coloradillo" in Honduras.

HEMIDIODIA Schumann

Perennial herbs, sometimes slightly suffrutescent at the base, with often elongate stems; stipules united with the petioles to form a setiferous sheath; leaves opposite, herbaceous, narrow, conspicuously nerved; inflorescence a fascicle of very small flowers clustered in the leaf axils, sessile; sepals 4, equal, connate at the base; corolla white, funnelform, the 4 lobes valvate in bud; stamens inserted at the apex of the corolla tube, exserted; fruit of 2 small carpels, these separating from the central septum, opening on the inner surface near the base.

The genus consists of a single species.

Hemidiodia ocimifolia (Willd.) Schum. in Mart. Fl. Bras. 6(6): 29. 1888. *Spermacoce ocimifolia* Willd. ex Roem. & Schult. Syst. Veg. 3: 530. 1818. Figure 63.

Wet thickets, open banks, hilly pine forest, 1,200 m. or lower; Petén; Izabal; Chiquimula; Suchitepéquez. Southern Mexico; British Honduras to Panama; West Indies; South America. Malaya.

Plants perennial, decumbent or ascending, less often erect, reported to attain sometimes a height of 1.5 m.; but usually scarcely half as tall, the stems puberulent or almost glabrous, obtusely tetragonous or subterete, often ferruginous; leaves petiolate, lanceolate or lance-oblong, 3-5 cm. long or larger, mostly 7-15 mm. broad, acuminate, attenuate to the base, puberulent or glabrous, scaberulous on the margins, paler beneath, the nerves often impressed on the upper surface; flowers in dense axillary clusters; sepals ovate, acute, 0.5 mm. long; corolla white or tinged with lavender, glabrous, 3-4 mm. long; fruit 3-4 mm. long, smooth, puberulent or almost glabrous.

A weedy plant, often common in waste places or thickets along the Atlantic coast of Central America, but barely reaching the Pacific slope in Honduras and crossing over in Costa Rica and Panama. Not known nor to be expected from Mexico to Panama along the Pacific where there is a prolonged dry season.

HILLIA Jacquin

Glabrous epiphytic shrubs with thick, terete or subangulate branches; stipules intrapetiolar, membranaceous, caducous; leaves opposite, petiolate, fleshy, becoming coriaceous when dried; flowers large, white, terminal, solitary, subsessile, bracteate and bracteolate; hypanthium obovoid or cylindric; calyx none or of 2-4 foliaceous caducous lobes; corolla salverform, the tube elongate, the throat ampliate, naked, the limb 3-7-lobate, the spreading lobes contorted in bud; stamens 4-7, inserted below the throat of the corolla, the filaments very short; anthers basifixed, elongate-linear, obtuse at each end, included; ovary 2-celled, the style filiform, clavate at the apex; ovules numerous, ascending, the placentae adnate to the septum; capsule elongate-oblong or cylindric, truncate, 2-celled, septicidally bivalvate; seeds numerous, imbricate, the testa spongy, produced at the base into an appendage and at the apex into a tuft of hairs.

About 20 species of tropical America, 19 being known from Mexico to Panama.

Leaves small, 2 cm. long or less, rounded at the apex; corolla tube 1.5 cm. long.

H. chiapensis.

Leaves much larger, mostly 4-12 cm. long; corolla tube (where known) much longer.

Capsule 8-9 cm. long; leaves acute or short-acuminate.....*H. macrocarpa*.

Capsule 5-7 cm. long; leaves rounded or very obtuse at the apex.....*H. tetrandra*.

Hillia chiapensis Standl. Journ. Wash. Acad. Sci. 16: 16. 1926.

Epiphytic in wet forest, 900-1,500 m.; Alta Verapaz; Chiquimula. Mexico (Chiapas); Costa Rica.

A small, densely branched, glabrous shrub; stipules oblong to obovate, 3-4 mm. long, rounded at the apex, caducous; petioles stout, 2-5 mm. long; leaf blades elliptic or oval to oblong-elliptic, usually 9-18 mm. long, 4-8 mm. broad, coriaceous, rounded at the apex, obtuse or subacute at the base, the lateral nerves obscure; corolla tube 15 mm. long, the broad lobes 7 mm. long; capsule about 2 cm. long, the valves after dehiscence 3-4 mm. broad.

Hillia macrocarpa Standl. & Steyerl. Field Mus. Bot. 23: 23. 1943. *Jazmín*.

Quezaltenango, the type collected on slopes of Volcán de Santa María, between Patzulín and Finca Pirineos, 1,300-1,500 m., *Steyermark* 33667.

An epiphytic shrub with thick ochraceous branches; leaves on thick petioles 4-7 mm. long, coriaceous, elliptic-oblong or oblanceolate-oblong, 6-8.5 cm. long, 2-3.5 cm. broad, acute or subacuminate, cuneately narrowed to the base, broadest at or slightly above the middle, the lateral nerves ascending at a very narrow angle, obscure; capsule short-pedicellate, narrowly cylindric, 8-9 cm. long, almost 1 cm. thick, shortly narrowed at the apex, gradually narrowed to the base.

Hillia tetrandra Swartz, Prodr. Veg. Ind. Occ. 58. 1788. *Jazmín*; *jazmín de montaña*. Figure 14.

On trees in wet forest, ranging from sea level to about 2,800 m., and widely distributed; Izabal; Petén; Baja Verapaz; Chiquimula (Montaña Tajurán); Suchitepéquez; Sololá; Quezaltenango; San Marcos. Southern Mexico to Panama; Cuba and Jamaica.

An epiphytic shrub 2 m. long or less, often pendent, sometimes growing on rocks, the stout branches brown or ochraceous; stipules oval or oblong, 1-2.5 cm. long, thin, obtuse or rounded at the apex; petioles stout, 5-25 mm. long; leaf blades obovate, oval, or oval-obovate, 5.5-10 cm. long, 2.5-6 cm. broad, usually rounded or very obtuse at the apex and often cuspidate-acuminate, acute or obtuse at the base, thick and coriaceous, the lateral nerves almost obsolete; hypanthium cylindric, 3-5 mm. long; calyx lobes 6, linear-lanceolate, obtuse, about 4 mm. long, sometimes wanting;

corolla tube 6-10 cm. long, 3-4 mm. thick, the 6 lobes lanceolate or lance-oblong, 2.5-4 cm. long; capsule 4-12 cm. long, 7-9 mm. thick, brown; seed body 2-3 mm. long, the brown or yellowish hairs 8-12 mm. long.

HINTONIA Bullock

Shrubs or small trees; stipules interpetiolar, small, acute; leaves opposite, petiolate, herbaceous, pubescent or glabrate; inflorescence a single axillary or terminal flower, rarely a 3-flowered cyme; flowers large and showy, solitary and axillary, pedicellate; hypanthium turbinate, 6-8-costate; calyx 6-lobate, the lobes narrow, more or less foliaceous, deciduous; corolla funnelform, symmetric, the tube 6-7 or 8-costate, the limb 6- or 8-lobate, the lobes in bud plicate-valvate, broadly triangular; stamens inserted at the base of the corolla tube, the filaments elongate, filiform; anthers linear, basifixed, not or hardly exserted; ovary 2-celled, the placentae affixed to the septum; the style filiform, shallowly bifid at the apex; capsule ellipsoid, only slightly compressed, conspicuously 6-costate and lenticellate, septicidally dehiscent; seeds biseriate, pendulous, numerous, compressed, winged.

Four species are known in Mexico and Guatemala. It is probable that a few species of *Coutarea* described from northern South America are congeneric. *H. octomera* (Hemsl.) Bullock, with 8-parted rather than 6-parted (as in Guatemalan species) corollas, occurs in Yucatan and may well extend into Petén. *H. latiflora* (Sessé & Mocino ex DC.) Bullock has been found recently in Chiapas about 100 km. from Guatemala.

Leaves narrowly lanceolate or oblong-lanceolate; corolla 9-11 cm. long; anthers 1.5 cm. long; pedicels 2-bracteolate.....*H. lumaeana*.

Leaves elliptic or ovate; corolla about 6 cm. long; anthers 3 cm. long; pedicels not bracteolate.....*H. standleyana*.

Hintonia lumaeana (Baill.) Bullock in Hook. Icon. 33: *t.* 3295, p. 5. 1935. *Coutarea lumaeana* Baill. Adansonia 12: 301. 1879. *Portlandia lumaeana* Baill. Hist. Pl. 7: 333. 1880. *Quina*.

Moist or wet, mixed forest, 1,200-1,500 m.; Guatemala, perhaps only in cultivation; described from a shrub grown in the garden of Don Jorge Luma, the seeds brought from San Jorge, Chimaltenango, a photograph of the type in herb. Field Museum; Quezaltenango (along road between Finca Pirineos and Calahuaché). Also in Mexico (Veracruz).

A large shrub or a tree 8 m. tall, glabrous throughout, with slender branches; stipules deltoid, 2-4 mm. long; petioles only 3-6 mm. long; leaf blades mostly narrowly lance-oblong, 8-11 cm. long, 1.5-3 cm. broad, acuminate or long-acuminate, obtuse to acuminate at the base; pedicels 5-14 mm. long, bracteolate below the middle, the bractlets small, green, subulate; hypanthium 6-7 mm. long, the calyx lobes 6, linear-subulate, about 1.5 cm. long; flowers sweet-scented, the corolla greenish white outside, pure white within, the tube 4.5 cm. broad at the throat, the

lobes about one-fourth as long as the tube; stamens partly exserted, slightly shorter than the corolla; capsule oval-globose, about 1.5 cm. long, coarsely 6-costate, inconspicuously lenticellate; seeds suborbicular, 4-5 mm. long, brown.

A handsome plant because of the large, pure white flowers. Employed in Huehuetenango as a remedy for malaria.

Hintonia standleyana Bullock in Hook. Icon. 33: t. 3295, p. 6. 1935. *Coutarea latiflora* DC. sec. Standl. N. Am. Fl. 32: 127. 1921, non Sessé & Moc. ex DC. Figure 18.

Dry plains and hillsides, about 200-250 m.; Zacapa (Zacapa and Gualán). Western and southern Mexico.

A shrub or small tree, sometimes 6 m. high, the trunk covered with rough checkered bark, the branchlets densely short-pilose when young, later often glabrate; stipules deltoid, 2-4 mm. long, acute or acuminate; petioles slender, 0.5-2 cm. long, the blades ovate or oval, 4-12 cm. long, 1.5-6 cm. broad, obtuse to short-acuminate, rounded to acute at the base, usually short-pilose above, whitish-tomentose beneath when young, or pilose, rarely almost glabrous except along the veins; pedicels ebracteolate, 5-15 mm. long; hypanthium densely or sparsely pilose, about 5 mm. long; calyx lobes linear or subulate, 6-10 mm. long; flowers sweet-scented, the corolla white, glabrous or pilose outside, the tube 3-4.5 cm. broad at the throat, the lobes half as long as the tube or shorter; stamens slightly shorter than the corolla; capsule oval, about 2 cm. long, brown, 6-costate, obscurely or conspicuously lenticellate; seeds 5-7 mm. long, brown.

The tree is a handsome one when covered with its abundant showy white flowers. It appears to be rare in the Zacapa region. In Oaxaca the tree is called "San Juan."

HOFFMANNIA Swartz

Herbs, shrubs, or small trees, glabrous or pubescent, often simple, the branchlets usually terete, rarely tetragonous; stipules interpetiolar, deciduous or persistent, small and inconspicuous; leaves opposite or verticillate, sometimes anisophyllous; flowers small, white, red, or yellow, ebracteolate, generally cymose, the cymes axillary, sessile or pedunculate, the flowers often secund; hypanthium oblong or turbinate, terete or angulate; calyx 4-lobate, rarely truncate, the short lobes persistent; corolla funnelform to subrotate, with short or elongate tube, the throat glabrous, the limb 4-lobate, the lobes lanceolate to oblong, obtuse or acute, imbricate in bud, sometimes only obscurely so, 2 of them exterior; stamens 4, inserted in the corolla throat or lower in the tube, the filaments short, complanate; anthers linear-oblong, dorsifixed, relatively large, obtuse or apiculate, exserted; ovary normally 2-celled, the style filiform, the stigma bilobate or clavate; ovules numerous, multiseriate, the placentae bilamellate, longitudinally affixed to the septum; fruit baccate, small, oblong to orbicular, 2-celled; seeds numerous, minute, the testa crustaceous, foveolate.

More than 125 species in tropical America, about 90 of these from North America.

There are doubtless more species in Guatemala than the rather large number indicated in this treatment. It is one of the largest genera of Rubiaceae in Central America with the greatest concentration of species in Guatemala and adjacent Mexico. The species are distinguished by small but apparently constant characters. The senior author thought the genus to be one of little practical interest, however monographic work should uncover interesting distributional patterns.

Stems conspicuously 4-angulate and sometimes narrowly winged on the angles.

Cymes sessile or subsessile; calyx lobes minute and deltoid; plants of the Atlantic slope.....*H. ghiesbreghtii*.

Cymes pedunculate and flowers often appearing racemose; calyx lobes triangular; plants of the Pacific slope.....*H. riparia*.

Stems terete, not winged.

Leaves conspicuously villous beneath, at least on the costa, with lax spreading hairs, often villous over the whole lower surface, or sometimes densely villosulous with very short hairs beneath along the costa.

Flowers densely clustered in the leaf axils, the inflorescences mostly much shorter than the petioles, the flowers sessile or on very short pedicels.

Calyx glabrous; leaves acute to attenuate at the base, green beneath.

H. confertiflora.

Calyx densely villous or villosulous.

Leaves long-attenuate at the base, green beneath.....*H. huehueteca*.

Leaves obtuse or rounded at the base, purple beneath*H. tuerckheimii*.

Flowers in cymes or panicles, not densely clustered, the inflorescences often elongate, lax, and much exceeding the petioles.

Leaves sessile*H. phoenicopoda*.

Leaves petiolate.

Leaves mostly obtuse or merely acute; plants herbaceous or at least low, commonly 60 cm. tall or less*H. bullata*.

Leaves acuminate or long-acuminate; plants usually tall shrubs, a meter high or often much taller.

Leaves villous on the upper surface with long spreading ferruginous hairs.

H. gesnerioides.

Leaves not villous on the upper surface, glabrous or pilose with short appressed hairs.

Corolla villous.....*H. tetrastigma*.

Corolla glabrous.

Corolla 20-25 mm. long, red; inflorescence usually lax and much branched, often equaling or exceeding the petioles*H. cauliflora*.

Corolla 10-12 mm. long, yellow or greenish yellow; inflorescence dense and compact, usually much shorter than the petioles.

H. chiapensis.

Leaves glabrous beneath, or sometimes puberulent, especially along the costa, never villous.

Inflorescence arising at the base of the plant; leaves large, 10 cm. broad or more.

H. rhizantha.

Inflorescences arising in the leaf axils or below the leaves, not basal.

Calyx lobes linear to linear-lanceolate, as long as to twice as long as the hypanthium, 2.5-5 mm. long.

Calyx lobes 4-5 mm. long; corolla lobes twice as long as the tube; lowland species.....*H. calycosa*.

Calyx lobes 2.5-3 mm. long; highland species.

Leaves petiolate; corolla 16-18 mm. long, tube and lobes subequal, glabrous.....*H. teruae*.

Leaves sessile or nearly so; corolla about 8 mm. long, the lobes about twice as long as the tube, sparsely pubescent with segmented hairs.

H. sessilifolia.

Calyx lobes narrowly triangular or broader, often obsolete, usually much shorter than the hypanthium, 2 mm. or less long.

Corolla 15-23 mm. long; lobes shorter than the tube; inflorescence long-pedunculate, usually much longer than the petioles.....*H. macrosiphon*.

Corolla about 1 cm. long or shorter, lobes about equaling or usually much longer than the tube.

Leaves conspicuously lineolate beneath with very numerous, pale, linear cystoliths.

Leaves opposite, large, sometimes 30 cm. long and 12 cm. broad; flowers cymose.....*H. lineolata*.

Leaves, at least in part, verticillate; 2-5 cm. long; flowers solitary in the leaf axils on long slender pedicels.....*H. quadrifolia*.

Leaves not lineolate beneath.

Lateral nerves of the leaves about 14-20 pairs, very conspicuous beneath; leaves large and broad, mostly 8-10 cm. broad or broader.

H. riparia.

Lateral nerves of the leaves relatively few, usually 12 or fewer; leaves mostly less than 8 cm. broad, often only 1-2 cm. broad.

Corolla sparsely villous; flowers all sessile or nearly so.

Branches villosulous; calyx lobes scarcely 1 mm. long.....*H. wilsonii*.

Branches glabrous; calyx lobes about 2 mm. long.....*H. tuerckheimii*.

Corolla glabrous; flowers all or mostly pedicellate.

Cymes long-pedunculate, longer than the petioles, or the flowers sometimes racemose, the peduncles usually equaling or longer than the cymes.

Flowers cymose; leaves broadest above the middle.....*H. rotata*.

Flowers racemose; leaves broadest at or below the middle.

H. racemifera.

Cymes sessile or short-pedunculate, the flowers never racemose, the inflorescences usually shorter than the petioles, the cymes rarely long-pedunculate but then evidently shorter than the petioles, or the flowers rarely solitary in the leaf axils and long-pedicellate.

Calyx lobes lance-subulate or lance-oblong, usually 1 mm. long or more, conspicuously longer than broad.

Inflorescences 1-2-flowered.....*H. uniflora*.

Inflorescences many-flowered.

Lateral nerves of the leaves obscure or almost obsolete, the blades mostly 2-2.5 broad.....*H. cryptoneura*.

Lateral nerves of the leaves very conspicuous, the blades mostly 4-6 cm. broad or larger.

Leaf blades elliptic-oblong or elliptic, mostly abruptly acute at the base and not decurrent.

H. psychotriaefolia.

Leaf blades oblanceolate or oblanceolate-oblong, long-attenuate to the base *H. angustifolia.*

Calyx lobes obsolete or broadly deltoid or rounded, less than 1 mm. long.

Calyx truncate or essentially so *H. nicotanaefolia.*

Calyx obviously dentate.

Tube of the corolla half as long as the lobes or less.

Leaves small, mostly 7 cm. long or shorter and 1-3 cm. broad, on petioles 1.5 cm. long or shorter... *H. montana.*

Leaves large, mostly 12-20 cm. long and 3-7 cm. broad.

Calyx and hypanthium less than 1.5 mm. long at anthesis; petioles 2-3 cm. long *H. vulcanicola.*

Calyx and hypanthium 2-3 cm. long at anthesis; petioles 1-2 cm. long *H. culminicola.*

Tube of the corolla about equaling the lobes, sometimes longer; leaves mostly 10-15 cm. long.

Leaves 2-2.5 cm. broad; corolla in bud rounded at the apex.

H. rotata.

Leaves mostly 5-8 cm. broad: corolla in bud narrowed at the apex *H. conzattii.*

Hoffmannia angustifolia Standl. Contr. U. S. Nat. Herb. 20: 206. 1919.

Occasional in damp or wet mixed forest, 1,000-1,800 m.; Quezaltenango; Sacatepéquez (type from Acatepéque, *Donnell-Smith* 2747); Chimaltenango; Zacapa; Jalapa. Mexico (Chiapas).

A slender, sparsely branched shrub, usually glabrous throughout, the branches subterete, green; leaves opposite, membranaceous, on petioles 1-2.5 cm. long, narrowly elliptic to narrowly lance-oblong or oblanceolate-oblong, 10-20 cm. long and 3-5 cm. broad or sometimes larger, long-acuminate or long-attenuate at the apex, usually long-attenuate to the base and often decurrent almost to the base of the petiole, the lateral nerves 12-14 pairs, conspicuous; cymes sessile, with few or many flowers, dense, shorter than the petioles, the flowers sessile or nearly so; hypanthium 2 mm. long, the calyx lobes lance-oblong, 1-1.5 mm. long, obtuse, ciliolate; corolla about 12 mm. long, pale green or greenish yellow, glabrous, the lobes linear-oblong, obtuse, equaling or slightly shorter than the tube; anthers 3 mm. long; berries 4 mm. long or more, oblong when dry, bright red.

The fruits of this species, like those of most other species of *Hoffmannia*, shrink greatly in drying so that the measurements given for the dry fruits are perhaps not more than half those of the fresh, juicy fruits.

This species has been assumed to be a common one extending in range from southern Mexico to Panama. The species actually is rather limited in distribution, as indicated above. Several other and quite distinct species have been determined as this species. The genus is much in need of monographic study.

Hoffmannia bullata L. Wms. Fieldiana, Bot. 36: 52. 1973.

Frequent in dense wet mixed forests or on wet banks along streams in the forest, occurring at or near sea level in the Atlantic lowlands but to about 1,400 m. on the Pacific slopes; Alta Verapaz; Izabal (type, *Steyermark* 38719); Suchitepéquez; Huehuetenango; Quezaltenango; San Marcos. Mexico (Chiapas); British Honduras; Honduras; Costa Rica.

Herbaceous or somewhat woody plants 10-60 cm. tall, erect or repent. Stems simple, subterete, or terete, densely ferrugineous-villous or glabrate, leafy above; leaves obovate to oblong or oblanceolate, acute or obtuse, long-attenuate to the base, short petiolate, bullate, pubescent or puberulent with segmented hairs along the nerves below, glabrous or glabrescent above, the blade 9-20 cm. long and 3-7 cm. broad, the lateral nerves 8-15 pairs, the petioles mostly 1-3 cm. long, stout, pubescent or glabrescent; inflorescences axillary, subumbellate or subracemose, the peduncles slender, 3-7 cm. long, glabrous or sparsely pilose pubescent, pedicels slender, 2-5 mm. long; flowers 3-10, dull brick red; calyx and hypanthium 3-4 mm. long, the hypanthium turbinate, glabrous, the calyx lobes triangular or lance triangular, acute, sparsely villosulous; corolla about 1 cm. long, glabrous, the lobes oblong, obtuse or acute, 2-3-times as long as the tube; stamens with short filaments, the anthers exserted; berry bright red.

This plant has gone under the name of *Hoffmannia refulgens* (Hook.) Hemsl. a plant described from horticulture and possibly of South American origin. The plant is not uncommon but the material in herbaria is often not good. It is possible that the material from Costa Rica is not the same as that from Mexico and Guatemala.

Hoffmannia calycosa Donn.-Sm. Bot. Gaz. 40: 4. 1905.

Moist or wet, mixed forest, 200-800 m.; Alta Verapaz (type from Cubilgüitz, *Tuerckheim* 7912); Sololá. Endemic.

A shrub, the branches terete, bifariously puberulent when young; stipules minute, deltoid-acuminate; leaves opposite, membranaceous, the slender petioles 1-2 cm. long, the blades obovate or obovate-elliptic, 9-15 cm. long, 3.5-5 cm. broad, short-acuminate, at the base acute, acuminate or attenuate, glabrous above, puberulent beneath along the veins or almost wholly glabrous, the lateral nerves conspicuous, 6-8 on each side; flowers sessile or nearly so and crowded in the leaf axils, the cymes 1 cm. long or less, subsessile; calyx and hypanthium sparsely villosulous, the hypanthium 2 mm. long; calyx lobes linear, 4-5 mm. long, acute; corolla glabrous,

about equaling the calyx lobes, the lobes linear-lanceolate, spreading, twice as long as the tube.

Hoffmannia cauliflora Hemsl. Diag. Pl. Mex. 30. 1879. Figure 35.

Wet mixed forest or thickets, 750-2,850 m.; endemic; type collected in Guatemala by Skinner, the locality unknown; Sololá; Suchitepéquez; Quezaltenango; San Marcos.

A shrub or small tree, 1.5-6 m. high, often almost simple or sparsely branched, the stout branches subterete, glabrous or nearly so; stipules caducous; leaves opposite, large, herbaceous, short-petiolate or essentially sessile, broadly elliptic or obovate-elliptic, 15-40 cm. long and 8-20 cm. broad or even larger, usually abruptly acuminate, usually long-attenuate to the base of the petiole, glabrous above or nearly so, beneath villous or villosulous, especially on the veins, the lateral nerves conspicuous, about 20 pairs; inflorescences mostly sessile, often borne at naked nodes below the leaves, many-flowered, 9 cm. long or less, glabrous, the flowers usually on long slender red pedicels; calyx and hypanthium 4 mm. long or less, the calyx lobes very short, deltoid; corolla glabrous, 20-25 mm. long, bright or dull red, the small lobes only 2-3 mm. long, ovate; ovary 3-4-celled; berries pale red or purplish black, 5-6 mm. long.

This is more showy than other species because of its large red flowers. The shrub is a very common one in many of the wet quebradas of Quezaltenango and San Marcos.

Hoffmannia chiapensis Standl. Contr. U. S. Nat. Herb. 20: 206. 1919.

Wet mixed forest of the western highlands, 1,400-3,000 m., common in many localities; Suchitepéquez; Quezaltenango; Huehuetenango; San Marcos. Mexico (Chiapas, the type from Cerro del Boquerón).

A shrub 1.5-4.5 m. tall, simple or sparsely branched, the branches obtusely angulate, glabrous; stipules small, deltoid, caducous; leaves opposite, membranaceous, on slender petioles 1.5-6 cm. long, elliptic to elliptic-oblong or oblong-oblancoate, 10-25 cm. long and 4-10 cm. broad or larger, acuminate, at the base acuminate to long-attenuate, bright green and glabrous above, beneath slightly paler, glabrous or along the costa somewhat puberulent, the lateral nerves about 14 pairs; cymes sessile or short-pedunculate, with few or many flowers, 4 cm. long or less, the slender pedicels 1-6 mm. long; hypanthium oblong, glabrous, 2 mm. long; calyx lobes lance-triangular or oblong, obtuse, 1-2.5 mm. long, sparsely puberulent or glabrous; corolla yellow or greenish, 10-12 mm. long, glabrous outside, the lobes narrowly oblong, obtuse, about equaling the tube; fruit oblong, 5-6 mm. long.

Hoffmannia confertiflora Standl. Contr. U. S. Nat. Herb. 20: 206. 1919.

Type from San Miguel Uspantán, Quiché, at 2,100 m., *Heyde & Lux* 3169. Also in San Marcos and Quezaltenango. Endemic.

A branched shrub 3 m. tall, the branches obtusely quadrangular or subterete, glabrous; leaves opposite, membranaceous, on petioles 3 cm. long or less, elliptic or oblong-elliptic, 6-12 cm. long, 2.5-5 cm. broad, acuminate, at the base acuminate or long-attenuate and decurrent, deep green above, copiously ferruginous-villous, at least when young, paler beneath, villosulous along the nerves, the lateral nerves about 11 pairs; cymes sessile, dense, with few or many crowded flowers, the flowers sessile or short-pedicellate; calyx and hypanthium 2-2.5 mm. long, glabrous, the calyx lobes minute, broadly deltoid; corolla 9-10 mm. long, white, glabrous outside, the lobes lance-oblong, acute, equaling the tube; anthers 3 mm. long.

Hoffmannia konzattii Robinson, Proc. Am. Acad. 45: 406. 1910. *Coffea obovata* Schlecht. & Cham. Linnaea 6: 412. 1831, not *Hoffmannia obovata* Standl., 1929.

Wet mixed forest 500-1,650 m.; Chimaltenango; Quezaltenango (near Santa María de Jesús); San Marcos; Huehuetenango. Mexico (Veracruz and Chiapas).

A simple or branched shrub 1-3 m. tall, glabrous throughout, the branches subterete; stipules ovate, caducous; leaves opposite, membranaceous, on slender or stout petioles 2-3.5 cm. long, elliptic to oblong-obovate or oblanceolate-oblong, 10-20 cm. long, 3.5-9 cm. broad, abruptly short-acuminate, long-attenuate to the base or abruptly decurrent, deep green above, paler and puncticulate beneath, the lateral nerves 8 or more pairs; cymes axillary, sessile or nearly so, dense, with few or many flowers, the pedicels equaling or shorter than the hypanthium; hypanthium subglobose, 2.5 mm. long, the calyx lobes minute, obtuse or acutish; corolla about 6 mm. long or as much as 10 mm., glabrous outside, the lobes oblong, spreading, slightly longer than the tube; anthers almost equaling the corolla lobes.

Hoffmannia cryptoneura Standl. Field Mus. Bot. 22: 53. 1940. *H. nubium* Standl. & L. Wms. Ceiba 1: 167. 1950 (type from Honduras, *Glassman* 1996). *Tzai-yat* (Huehuetenango).

Moist forests or cloud forests at 1,300-2,100 m.; Baja Verapaz; San Marcos; Quezaltenango; Quiché; El Progreso; Zacapa. Mexico (Chiapas, the type from Mt. Ovando, *Matuda* 944); Honduras.

A branched shrub 1.5 m. high, the branches terete, glabrous; leaves opposite, membranaceous, on petioles 6-17 mm. long, oblanceolate or oblong-oblanceolate, 7-12 cm. long, 2-3 cm. broad, narrowly acuminate or sometimes attenuate to an obtuse tip, gradually long-attenuate to the base, glabrous, blackening when dried, paler beneath, the lateral nerves about 8 pairs but very obscure or almost obsolete; flowers densely clustered in the leaf axils or in small short-pedunculate cymes, the pedicels 5 mm. long or less; hypanthium turbinate, glabrous, 1 mm. long; calyx teeth short, triangular, acute; corolla glabrous outside, the slender tube 5-6 mm. long, the lobes of about the same length, spreading, oblong-linear, obtuse; stamens about equaling the

corolla lobes, the filaments exerted, the linear anthers 3.5 mm. long; fruit dull red, very juicy.

The species is rare in Chiapas and in Guatemala, but it is to be found in many cloud forests in Honduras.

Hoffmannia culminicola Standl. & L. Wms. Ceiba 1: 166. 1950.

Cloud forests, alt. 1,400-2,400 m. or perhaps more; Chiquimula; Jalapa. El Salvador and Honduras (type, *Standley 4797*).

Small fragile shrubs 0.5-2 m. tall. Stems simple or usually branched, obscurely angled at first, becoming terete, glabrous, to about 8 mm. in diameter, often with conspicuous cystoliths; leaves oblanceolate to oblong-ob lanceolate, acuminate, acute at the base, glabrous, cystoliths common on the lower surface, short petiolate, the blade 6-23 cm. long and 1.5-6.5 cm. broad, the lateral veins 5-8 pairs, diverging at an obtuse angle, mostly *not* anastomosing toward the margins, the petiole mostly 1-2 cm. long; inflorescences short few-flowered axillary cymes, peduncles 1-6(-10) mm. long, slender, pedicels mostly 1-2 mm. long; flowers small, yellowish, the corolla early deciduous; hypanthium and calyx small, glabrous, 2-3 mm. long at anthesis, calyx lobes triangular, acute, about 0.5-0.75 mm. long and as broad; corolla campanulate, 5-7 mm. long, the four oblong-lanceolate, acute lobes twice as long as the tube; stamens 4, inserted on the corolla throat, filaments about 0.5 mm. long, attached to the anther above the base, anthers linear-oblong, obtuse, about 3 mm. long; style subclavate, 5-6 mm. long, the stigma subglobose; fruits fleshy, globose, about 1 cm. long at maturity.

This species may be distinguished from the closely allied *H. angustifolia* (11-13 pairs) by the few lateral nerves (5-8 pairs) and by the triangular and acute calyx lobes, not lance-oblong, obtuse lobes.

Hoffmannia gesnerioides (Oerst.) Kuntze, Rev. Gen. Pl. 285. 1891. *Ophryococcus gesnerioides* Oerst. Vid. Medd. Kjoebenhavn 1852: 53. 1852.

Wet mixed forest about 1,500 m.; Zacapa (summit of Sierra de las Minas); Chiquimula (Cerro Tixixí, north of Jocotán). Mountains of Honduras and Nicaragua.

A stout shrub about 60 cm. high, or almost herbaceous, simple or sparsely branched, the branches subterete, densely villous with long spreading rufous hairs; leaves opposite, on slender petioles 2-3.5 cm. long or essentially sessile, oblong to obovate-elliptic, 9-18 cm. long, 3-8.5 cm. broad, long-acuminate, long-attenuate to the base, often to the base of the petiole, membranaceous, when young densely villous on both sides with long soft rufous hairs, green above and marked with numerous pale cystoliths, the lateral nerves about 9 pairs; cymes axillary, few-flowered, the peduncles short in anthesis but in fruit as much as 2.5 cm. long or even more, the pedicels mostly 2-3 mm. long; hypanthium turbinate, 2 mm. long, villous, the calyx

lobes linear, 3 mm. long, acuminate, villous on the margins, corolla 6-8 mm. long, villous, the lobes short, triangular; fruit ovoid, purple or purplish pink, 7 mm. long or more, sparsely villous; seeds minute, coarsely foveolate.

An easily distinguished plant because of abundant pubescence of long, soft, multicellular hairs. This species is the type of Oersted's genus *Ophryococcus*. Two collections from Guatemala are fruiting and while closely allied to *H. gesnerioides*, they may prove to be distinct when better material is available. The specimens actually may represent two species.

Hoffmannia ghiesbreghtii (Lem.) Hemsl. Biol. Centr. Am. Bot. 2: 36. 1881. *Campylobotrys ghiesbreghtii* Lem. Ill. Hort. 8: t. 279. 1861. *Higginsia ghiesbreghtii* ("gheisbechtii") Hook. Bot. Mag. 89: t. 5383. 1863.

Dense wet mixed forest, often on limestone, 1,300 m. or lower; Petén; Alta Verapaz; Izabal. Mexico; British Honduras; described from cultivated plants possibly of Mexican origin.

A simple or sparsely branched shrub about 1 m. high, rarely somewhat taller, the stout branches acutely quadrangular, narrowly winged on the angles, glabrous or nearly so; leaves opposite, large, sessile or essentially so, oblanceolate-oblong or obovate-oblong, 20-39 cm. long, 6-9 cm. broad, acute or abruptly acuminate, long-attenuate to the base, membranaceous, bright green and glabrous above, paler beneath, sometimes purplish, minutely puberulent, especially on the veins, or glabrate, the lateral nerves about 20 on each side; cymes axillary, with few or many flowers, dense and subsessile, the flowers sessile or subsessile; calyx and hypanthium 2 mm. long, puberulent, the calyx lobes minute, deltoid; corolla yellow, sometimes tinged with red, 6 mm. long, puberulent, the lobes narrowly oblong, acute, spreading, equaling or slightly longer than the tube; berries red, 3-4 mm. long when dry.

The leaves often are handsomely colored with deep purple beneath. In Alta Verapaz the shrub has been found only at lower elevations on the characteristic forested limestone formations approaching the plains of Petén.

Hoffmannia huehueteca Standl. & Steyerl. Field Mus. Bot. 23: 249. 1947.

Moist or wet, mixed, mountain forest, 1,500-3,300 m.; El Progreso (Volcán de Santa Luisa); Huehuetenango (Sierra de los Cuchumatanes, type from Cerro Negro 2 miles east of Las Palmas, *Steyermark* 51697). Mexico (Chiapas).

A shrub of 1.5 m., or sometimes not more than 30 cm. high, erect, usually simple, the stems stout, very densely ferruginous-villosulous with short hairs; stipules triangular-acuminate, 3 mm. long or less; leaves herbaceous, on stout petioles 2 cm. long or shorter, oblanceolate or obovate-oblong, 10-20 cm. long, 2-7.5 cm. broad,

shortly cuspidate-acuminate with an obtuse tip, gradually long-attenuate to the base and often decurrent almost to the base of the petiole, green and glabrous above, green and paler beneath, brownish when dried, very densely and shortly ferruginous-villosulous on the costa and nerves, puberulent between them, the lateral nerves conspicuous, about 12 on each side, arcuate-divergent at a wide angle; flowers numerous, densely aggregate in the leaf axils, cymulose, the cymules sessile or very shortly pedunculate, the flowers sessile or short-pedicellate; hypanthium villosulous or almost glabrous, oval, 2 mm. long; calyx lobes narrowly triangular or narrowly oblong, 2 mm. long, obtuse or acute, villosulous or almost glabrous; fruit red, suboval, glabrous or glabrate, 3.5-4 mm. long when dry; seeds numerous, minute.

Hoffmannia lineolata Donn.-Sm. Bot. Gaz. 40: 5. 1905.

Mountains of Alta Verapaz, 350-1,650 m., in 'dense wet mixed forest; endemic; type from Cubilgütz, at 350 m., *Tuerckheim* 8227.

A slender shrub, the branches subterete, glabrous or nearly so; leaves opposite, membranaceous, on slender petioles 2-7 cm. long, obovate-oblong or oblanceolate-oblong, as much as 30 cm. long and 12 cm. broad but usually smaller, acuminate, attenuate to the base, densely covered with pale linear cystoliths, minutely puberulent beneath along the veins or almost wholly glabrous, the lateral nerves 14-17 on each side; flowers short-pedicellate, in few-flowered dense cymes 1.5-2.5 cm. long; calyx and hypanthium ferruginous-puberulent, 2 mm. long, the calyx lobes minute, deltoid; corolla 6 mm. long, yellowish green, sparsely puberulent, the lobes linear-oblong, spreading, twice as long as the tube; anthers sessile, 3 mm. long; ovary 2-celled; fruit globose, the seeds reddish.

Hoffmannia macrosiphon Standl. Field Mus. Bot. 17: 276. 1937.

Wet mixed mountain forest, 2,000-3,000 m.; endemic; Quezaltenango (type from Volcán de Zunil, at 2,400 m., *Skutch* 937); San Marcos. Possibly also in Mexico (Chiapas).

A glabrous shrub 1.5-4.5 m. high, sometimes weak and reclining, sparsely branched, the branches terete; leaves opposite, thick-membranaceous, on petioles 1-2 cm. long, narrowly oblanceolate-oblong, 7-12 cm. long, 2.5-3.5 cm. broad, rather abruptly acute or acuminate, narrowly long-attenuate to the base, pale beneath, the lateral nerves about 8 pairs, inconspicuous; cymes axillary, solitary, mostly 2-3-flowered, on peduncles 3 cm. long or less, the slender pedicels about 1 cm. long; hypanthium narrowly oblong, 4 mm. long, 1.5 mm. broad, glabrous, the calyx 2.5 mm. broad, erect, obtusely dentate; corolla glabrous, dull yellowish or whitish, the lobes usually tinged with red or the whole corolla pale red, the tube about 2 cm. long, 5 mm. broad in the throat, the lobes rounded-ovate, obtuse, 6 mm. long, somewhat spreading, glabrous within; anthers half exserted, almost 4 mm. long; berries narrowly oblong, 10-12 mm. long, 3-5 mm. thick, pale green, turning deep red.

Hoffmannia montana L. Wms. Fieldiana, Bot. 36: 55. 1973.

Wet mountain forests or cloud forests, 1,400-2,700 m.; San Marcos; Quezaltenango (type, *Skutch* 936); Huehuetenango; Suchitepéquez; El Progreso. Mexico (Chiapas).

Much branched slender shrubs 1.5-3 m. tall. The branches at first somewhat and often sparsely and bifariously fulvous pubescent in the intervals or soon becoming terete and glabrous; leaves opposite or rarely ternate, narrowly to broadly oblanceolate, long acuminate, attenuate to a short petiole; glabrous or sparsely pubescent on petiole and nerves of underside of leaf but soon glabrous, nerves 4-7(-8) pairs diverging at obtuse angle, blades (3-)4-8 cm. long and (0.6-)2-3 cm. broad, petioles mostly 0.5-1.5 cm. long; inflorescence axillary, short-pedunculate, 1-few-flowered, peduncles subfiliform, 2-15 mm. long; pedicels filiform, mostly 3-10 mm. long; hypanthium and calyx at anthesis turbinate, 2-3 mm. long; calyx divided to near the base, the lobes triangular, 0.5-1 mm. long, glabrous; corolla white to pale yellow, up to 1 cm. long, lobate to near the base, the lobes linear-lanceolate, acute, glabrous, 5-7 mm. long, the tube 1-2 mm. long; stamens inserted in the throat of the corolla, the filaments short, anthers linear, 2.5-3.5 mm. long, exserted; style filiform, simple, about 5-8 mm. long, the stigmas clavate lanceiform, undivided and 4-5 mm. long; mature fruits fleshy, to about 5-6 mm. in diameter.

This species has been confused with *Hoffmannia excelsa* (HBK.) Schum. which occurs most commonly in the state of Vera Cruz, Mexico. It has a bifid style and the corolla divided to about the middle, not to near the base.

Hoffmannia nicotanaefolia (Mart. & Gal.) L. Wms. Fieldiana, Bot. 36: 56. 1973. *Psychotria nicotanaefolia* Mart. & Gal. Bull. Acad. Brux. 11, pt. 1: 229. 1844. *Hoffmannia lenticellata* Hemsl. Diag. Pl. Mex. 30. 1879. *Aegiphila hoffmannioides* Standl. & Steyerl. Field Mus. Bot. 23: 227. 1947 (type from Huehuetenango, *Steyermark* 48843).

Common in wet mixed forests or thickets, sometimes in pine forest, 900-1,600 m.; Alta Verapaz; Baja Verapaz; Sololá; Huehuetenango. Mexico; British Honduras; Honduras.

A glabrous branched shrub 1-3 m. high, the branches subterete; stipules linear-oblong, 6 mm. long or less, deciduous; leaves opposite, on stout petioles 0.5-3 cm. long, obovate to obovate-oblong or elliptic, 10-22 cm. long, 5-8.5 cm. broad, obtusely acuminate, long-attenuate to the base, membranaceous or subcoriaceous, the lateral nerves conspicuous, 11-14 on each side; flowers axillary, commonly cymose-fasciculate, about 6 mm. long, long-pedicellate; calyx and hypanthium 2 mm. long, the calyx truncate or obscurely dentate; corolla white or yellowish green, often tinged outside with red, the lobes ovate-oblong, about twice as long as the tube; fruit 2-celled, purplish black, juicy, sweet, 4-8 mm. long; seeds minute, angulate, punctate.

Hoffmannia phoenicopoda Schum. Notizbl. Bot. Gart. Berlin 2: 276. 1899.

Dense wet mixed forest, 1,000-2,000 m.; Alta Verapaz; Zacapa; Huehuetenango. Described from cultivated plants of unknown origin.

Plants herbaceous, 20-100 cm. high, the stems simple, stout, subangulate, sparsely villous or glabrous; stipules ovate-deltoid, 4 mm. long, obtuse or subacute, green, persistent; leaves opposite, sessile, obovate or obovate-oblong, 10-25 cm. long, 4-11 cm. broad, acute or broadly short-acuminate, or often obtuse, long-attenuate to the rounded or slightly amplexicaul base, succulent, somewhat bullate, dark green above, glabrous or thinly villous, reddish beneath, puberulent or villosulous along the veins, the lateral nerves 18-20 on each side; inflorescence dense, cymose, few-flowered, the flowers sessile or subsessile, the slender peduncles 2-8 cm. long, rufous-villous; hypanthium turbinate, 2 mm. long, glabrous, the calyx lobes triangular, 1.5-2 mm. long, acute, sparsely villous; corolla sparsely villous, bright red or yellowish red, 9-12 mm. long, the lobes lance-oblong, twice as long as the tube or longer; anthers 5 mm. long; fruit deep red.

Hoffmannia psychotriaefolia (Benth.) Griseb. Fl. Brit. W. Ind. 321. 1861. *Higginsia psychotriaefolia* Benth. ex Oerst. Vid. Medd. Kjoebenhavn 1852: 50. 1852.

Baja Verapaz. Extending southward to Panama, the type from Volcán de Barba, Costa Rica.

A branched shrub 1-2.5 m. high, glabrous throughout, the young leaves usually ciliate, the slender branches subterete; leaves opposite, on slender petioles 1-4 cm. long, elliptic-oblong or elliptic, 7-15 cm. long, 2.5-5 cm. broad, cuspidate-attenuate, acute or attenuate at the base, usually abruptly differentiated from the petiole, bright green above paler beneath, the lateral nerves 8-10 pairs, conspicuous; cymes sessile, dense, few-flowered, usually shorter than the petioles, the flowers short-pedicellate; calyx lobes 1.5-2 mm. long, narrowly deltoid, acute; corolla yellow, 8-11 mm. long, the lobes lance-oblong, acute, about equaling the tube; anthers yellow, 4 mm. long; style bifid; berries red, oblong, 7-8 mm. long.

This species originally described from Costa Rica is also found in the highlands of Panama. It is possible that the single collection known from Guatemala is another species, perhaps an undescribed one.

Hoffmannia quadrifolia Standl. & Steyerl. Field Mus. Bot. 23: 250. 1947.

Known only from the type, Zacapa, Sierra de las Minas, around the summit of Monte Virgen, about 2,400 m., *Steyermark* 42600.

A very slender and laxly branched shrub 1-2.5 m. high, the branches pale or ochraceous, almost glabrous, the young branches sparsely pilosulous with short curved hairs, the internodes short; leaves small, thin-membranaceous, many of them quaternate, others ternate or opposite, on slender petioles 2-8 mm. long, oblong-elliptic or elliptic-oblong, 2-5 cm. long, 8-15 mm. broad, obtusely acute or

acuminate, long-attenuate to the base and sometimes decurrent almost to the base of the petiole, ciliate, deep green above, fuscous when dried, much paler beneath, the lateral nerves about 4 on each side, obscure, the blade bearing numerous short pale linear cystoliths on both surfaces, or these often obscure or obsolete in adult leaves; flowers axillary, solitary, few, the pedicels 2-3 mm. long; hypanthium narrowly turbinate, glabrous, 2 mm. long; calyx lobes lance-subulate, acuminate, 0.5 mm. long; corolla greenish white, 6 mm. long in bud, somewhat narrowed to the obtuse apex, the tube narrowly obconic; fruit red, oval, glabrous, when dry only 3 mm. long.

The type, and only known collection of this species is inadequate. It is possible that the plant is not a *Hoffmannia*. The shining straw-colored stems and quaternate leaves are unusual.

Hoffmannia racemifera Standl. & Steyerl. Field Mus. Bot. 23: 259. 1947.

Known only from the type region, Izabal, Cerro San Gil, at 300-1,200 m.; type, *Steyermark 41910*.

A simple or branched, glabrous shrub, the branches slender, the older ones ochraceous, with short internodes; stipules inconspicuous, deltoid, 1.5 mm. long; leaves thin-membranaceous, on slender petioles 1.5-4.5 cm. long, elliptic or ovate-elliptic, 10-16 cm. long, 4-7.5 cm. broad, acuminate or cuspidate-acuminate with a long narrow acumen, obtuse or acute at the base, not or scarcely decurrent, the lateral nerves about 8 on each side, arcuate-ascending at a wide angle; inflorescences axillary, racemose, simple, few-flowered, on long slender peduncles, lax, usually longer than the petioles, the flowers secund, on slender pedicels 4-6 mm. long; hypanthium obovoid-turbinate, 1.5 mm. long, acute at the base, glabrous; calyx lobes scarcely 0.5 mm. long, triangular, acute; corolla in young bud slightly narrowed to the obtuse apex, glabrous; fruit globose-oval, white, 4 mm. long when dried.

Hoffmannia rhizantha Standl. Carnegie Inst. Wash. Publ. 461: 90. 1935.

British Honduras, in forest along creek bank, Esperanza trail, 630 m., *Schipp S731*; to be expected in Petén.

A glabrous shrub about 60 cm. tall, simple, the thick stems obtusely tetraginous; leaves very large, herbaceous, opposite, on petioles 3-6 cm. long, the petioles marginate for all or most of their length; leaf blades oblong-obovate, 23-32 cm. long, 10-12 cm. broad, rather abruptly acuminate, long-attenuate to the base, paler beneath, the lateral nerves about 14 pairs; inflorescence small and lax, arising from the base of the stem, sessile and branched from the base, 4 cm. long, the flowers pedicellate; hypanthium narrowly oblong, attenuate to the base, 3-5 mm. long, calyx lobes erect, lance-oblong, acuminate; corolla red, glabrous, 5-6 mm. long, attenuate in bud, oblong-linear, acuminate, the tube extremely short.

Hoffmannia riparia Standl. Field Mus. Bot. 17: 214. 1937.
Quinahuach del río.

Wet mixed forest of the Pacific, 550-1,400 m.; Suchitepéquez; Quezaltenango (type from Colomba, growing beside stream in forest, *Skutch 1291*); San Marcos. Mexico (Chiapas).

A shrub 1.5-3 m. tall, simple or branched, glabrous throughout or nearly so, the stout branches subterete; stipules short, acute; leaves large, opposite, firm-membranaceous when dry, on stout petioles 1-5.5 cm. long, oblong-obovate or obovate, 15-30 cm. long, 6-12 cm. broad, acute or short-acuminate, long-attenuate toward the base and long-decurrent upon the petiole, slightly paler beneath, drying brownish, the lateral nerves very conspicuous, about 20 pairs; cymes axillary and also arising from naked nodes below the leaves, lax and many-flowered, about 5 cm. long, fasciculate, sessile, glabrous, the flowers often conspicuously secund, the slender pedicels 6 mm. long or less; calyx lobes broadly triangular, about 1 mm. long; corolla about 7 mm. long, yellowish green, the oblong lobes longer than the tube; berries pale purple or red, oval or subglobose, 6-8 mm. long.

The shrub is abundant in many parts of the Pacific slopes of the Sierra Madre, usually growing in dark places along or near stream banks.

Hoffmannia rotata Donn.-Sm. Bot. Gaz. 18: 204. 1893. *H. steyermarkii* Standl. Field Mus. Bot. 22: 192. 1940 (type from San Marcos, *Steyermark 36426*).

Wet forests on the Pacific slopes of the Sierra Madre, 2,000-3,000 m.; San Marcos; Huehuetenango; Quiché (type from Uspantán, *Heyde & Lux 3169, 3170*). Mexico (Chiapas).

A slender shrub 1-2 m. high, the branches subterete, densely ferruginous-puberulent at first; stipules minute, deltoid; leaves 3-4-verticillate or opposite, on stout petioles 1 cm. long or shorter, narrowly oblanceolate to oblong-oblanceolate, 8-18 cm. long, 2-4 cm. broad, acute or acuminate, long-attenuate to the base, membranaceous, bright green above, glabrous or sparsely puberulent, paler beneath, copiously puberulent especially along the veins, the lateral nerves 9-12 on each side; flowers umbellate-cymose, slender-pedicellate, the pedicels usually longer than the calyx, the cymes 6-15-flowered, on slender peduncles 1-5 cm. long; calyx and hypanthium glabrous, 2 mm. long, the calyx lobes minute, deltoid; corolla 6 mm. long, glabrous, the tube almost obsolete, the lobes oblong, obtuse; anthers 2.5-3 mm. long, exserted, about twice as long as the filaments; fruit globose, red, 5 mm. in diameter, 2-celled; seeds minute, reddish brown.

Hoffmannia sessilifolia L. Wms. Phytologia 25: 463, *fig. 1973*. Figure 36.

Wet cloud forest at about 1,600 m., Baja Verapaz (Sierra de las Minas, type from above Purulhá, *Williams, Molina and Williams 41977*).

Erect slender sparsely branched glabrous shrubs to 3 m. tall. The branches slender, terete with inconspicuous longitudinal raphides, the internodes at maturity

6-10 cm. long; leaves opposite, equal, rather large, sessile and obtuse to subauriculate or subcordate at the base, oblanceolate or oblong-lanceolate, acuminate, 5-16 cm. long and 2-5.5 cm. broad, green above, bright purple beneath but apparently becoming green with age, the lateral nerves 10-14 on each side, appearing somewhat white-marginate with age; inflorescences short, few-flowered axillary cymes, the peduncles 0.2-1 cm. long; flowers tinged with red; calyx and hypanthium 5-6 mm. long, the hypanthium 2-3 mm. long, glabrous, 8-ridged, the calyx divided to the base, the lobes linear-oblong, acute, 2.5-3 mm. long, sparsely pubescent or ciliate with segmented hairs, with minute glandular or hairlike appendages in the sinu; corolla 4-lobate, the lobes lanceolate or lance-oblong, acute, 6-7 mm. long, sparsely pubescent dorsally with large segmented hairs, the tube 3-4 mm. long; stamens attached below the throat of the corolla, 4-4.5 mm. long; style 9-10 mm. long, the stigmas somewhat enlarged and bilobate; fruits not known.

Easily distinguished from other species in Central America and Mexico by the sessile leaves, usually obtuse and auriculate or subcordate at the base, and the unwinged stems. The closest ally is *H. ghiesbreghtii*.

Hoffmannia teruae Williams & Molina, Fieldiana, Bot. 36: 59. 1973.

Cool and wet mountains forests, 1,700-3,000 m.; endemic but to be expected in Chiapas; San Marcos; Sololá.

Weak forest shrubs to 2 m. tall. Stems glabrous, terete, the flowering stems to about 5 mm. in diameter, the internodes about 5 cm. long; leaves elliptic to oblanceolate, acuminate, glabrous, with about 11-13 pairs of lateral nerves not anastomosing, the angle rather acute, petiolate, the blade 10-22 cm. long and 2.5-6.5 cm. broad, attenuate into the 1-3 cm. long petiole; inflorescence axillary in the new growths, few-several-flowered nearly sessile fascicles, glabrous, peduncles none, pedicels 2-3 mm. long; hypanthium turbinate and 1.5-2 mm. long at anthesis; calyx divided almost to the base, lobes linear-lanceolate, 2.5-3 mm. long and 0.6-0.8 mm. broad, acute, ciliolate; corolla 16-18 mm. long at anthesis, the tube narrow and 8-9 mm. long, the lobes linear-oblong, 8-9 mm. long and about 2 mm. broad, subacute and apiculate thickened at the apex; stamens inserted in the throat of the corolla, the filaments rather thick, 3.5-4 mm. long, anthers linear, obtuse, about 4.5 mm. long; style about 18 mm. long, simple, clavate thickened at the apex and the stigmatic area about 4.5 mm. long; fruits not known.

A highland species easily distinguished by the long and narrow calyx lobes and the rather large corolla about equally divided into tube and lobes. The long internodes and large leaves are also distinctive.

Hoffmannia tetrastigma Donn.-Sm. Bot. Gaz. 27: 336. 1899.

Damp mixed mountain forests, 1,600-1,800 m.; endemic; Santa Rosa (type from Zamorora, *Heyde & Lux* 4490); Guatamala; Sacatepéquez; Escuintla; Chimaltenango.

A shrub 1-3 m. high, the stout branches subterete, densely ferruginous-villous; stipules triangular, caducous; leaves opposite, on stout petioles 1.5-5 cm. long, obovate or oblong-elliptic, 15-35 cm. long, 7.5-11 cm. broad, acute or acuminate, at the base acute to attenuate, membranaceous, bright green above, appressed-pilose or puberulent with ferruginous hairs, slightly paler beneath, copiously ferruginous-villous, especially along the veins, the lateral nerves 14-15 on each side; cymes axillary or arising at naked nodes below the leaves, fasciculate, many-flowered, 9 cm. long or less, the flowers short-pedicellate; calyx and hypanthium 3 mm. long, villosulous, the calyx lobes minute, deltoid; corolla 11-14 mm. long, ferruginous-villosulous, the lobes oblong-triangular, 4-5 mm. long; anthers 4 mm. long; ovary 4-celled; fruit purple or almost black, very juicy, about 1 cm. long.

Hoffmannia tuerckheimii Donn.-Sm. Bot. Gaz. 47: 254. 1909.

Moist or wet, mixed forest, 1,400-2,300 m.; Alta Verapaz (type from forest near Cobán, *Tuerckheim II.2160*); El Progreso.

An erect shrub 1 m. high or less, simple or with few branches, the branches terete, ferruginous-villous with multicellular hairs; stipules triangular; leaves opposite, on stout petioles 1.5-2.2 cm. long, oval-ovate to rounded-elliptic, 5-10.5 cm. long, 2.5-6 cm. broad, short-acuminate, at the base rounded or abruptly contracted and short-decurrent, glabrous above or villous along the costa, beneath usually dark purple-red, ferruginous-villous, especially along the veins, the lateral nerves 5-7 on each side; flowers few, fasciculate in the leaf axils, subsessile; calyx and hypanthium purplish-villous, 3 mm. long, the hypanthium obovoid, the calyx lobes triangular, subulate, half as long as the hypanthium; corolla sparsely villous, 12 mm. long, the lobes linear, the tube very short.

The plant is frequent in the very wet mountains above Tactic, where it is conspicuous because of the usually dark purple under surfaces of the leaves. A notable variant of the species is *H. tuerckheimii* var. *glabra* Standl. & Steyerl. Field Mus. Bot. 23: 250. 1947 (type from Sierra de las Minas, El Progreso, Montaña Canahui, between Finca San Miguel and summit of mountain, 1,600-2,300 m., *Steyermark 43806*). In this the branches and leaves are quite glabrous, but the corolla is sparsely villous. In other characters it is exactly like the typical form of the species.

Hoffmannia uniflora Standl. Contr. U. S. Nat. Herb. 20: 204. 1919.

Moist or wet, mixed forest, 1,100-3,300 m.; endemic; Alta Verapaz (type from Cobán, *Tuerckheim II.2107*).

A shrub, the slender branches subterete, bifariously rufous-puberulent; stipules deltoid, acutish, 1 mm. long, deciduous; leaves opposite, on slender petioles 3-6 mm. long, narrowly oblong-elliptic or lance-elliptic, 4-8 cm. long, 1-2 cm. broad, acuminate or long-acuminate, attenuate to the base, membranaceous, deep green and glabrous above, paler beneath, sparsely puberulent along the veins or glabrate, the lateral

nerves about 6 on each side; flowers mostly solitary in the leaf axils, sometimes in 2-flowered cymes, the slender pedicels 3-6 mm. long, glabrate; calyx lobes linear, acute, in fruit 2-3 mm. long; fruit oval, 6-7 mm. long, 5-6 mm. broad, glabrous; seeds minute, brownish, coarsely reticulate.

Hoffmannia vulcanicola Standl. & Steyerl. Field Mus. Bot. 23: 251. 1947.

Moist or wet, mixed, mountain forest, 1,000-1,700 m.; endemic; Sololá (type from slopes of Volcán de Atitlán above Finca Mocá, *Steyermark 47931*); San Marcos (Volcán de Tajumulco, above Finca El Porvenir).

A glabrous shrub 2-3 m. high, the branches very slender, terete, with elongate internodes; leaves membranaceous, on slender petioles 2-3 cm. long, elliptic-lanceolate or elliptic, mostly 12-15 cm. long and 4.5-7 cm. broad, narrowly long-acuminate, acute or obtuse at the base, not or scarcely decurrent, fuscous above when dried, paler beneath, the lateral nerves about 11 on each side, very slender, arcuate-ascending at a wide angle; inflorescences solitary or in fascicles of 2-3, on peduncles as much as 3 cm. long, laxly cymose or cymose-paniculate, mostly few-flowered, the very slender pedicels 3-7 mm. long; hypanthium narrowly clavate, 1.5 mm. long, glabrous; calyx scarcely 0.4 mm. high, the teeth minute, triangular, subacute; corolla pale yellow, glabrous, 8 mm. long, in bud almost linear and acute or acuminate, 5-lobate almost to the base, the lobes lance-oblong, acute, the tube very short; fruit oval, 5 mm. long when dried.

Hoffmannia wilsonii Standl. Field Mus. Bot. 22: 117. 1940.

Alta Verapaz, the type from Finca Los Alpes, 1,200 m., in virgin forest, *C. L. Wilson 344*.

A shrub 2-3 m. high, the branches terete, sordid-villosulous when young; stipules acuminate from a broadly triangular base, 2 mm. long; leaves membranaceous, opposite, on slender petioles 3-5.5 cm. long, ovate-elliptic or oblong-elliptic, 12-18 cm. long, 6-8 cm. broad, rather abruptly long-acuminate, acute or subobtuse at the base, green and glabrous above, appressed-pilose beneath along the veins, the lateral nerves about 8 on each side; flowers densely clustered in the leaf axils, sessile or short-pedicellate; hypanthium oblong-turbinate, about 2 mm. long, glabrous or very sparsely pilosulous; calyx lobes scarcely 1 mm. long, triangular-subulate, erect, acute; corolla glabrous outside or sparsely pilose, 7 mm. long, the narrow lobes acutish, much longer than the tube.

HOFFMANNIA MACROPHYLLA (Planch.) Hemsl. Biol. Cent. Am. Bot. 2: 37. 1881. *Higginsia macrophylla* Planch. Fl. Serres 5: 482d. 1849. Described from plants cultivated in Belgium, grown from Guatemalan seeds. The identification of the plant is doubtful.

HOUSTONIA Linnaeus

Erect or prostrate herbs, annual or perennial, rarely low shrubs, glabrous or pubescent; stipules entire, dentate, or laciniate, persistent; leaves opposite, sessile or petiolate, broad or narrow; flowers small, white, purple, or blue, axillary and solitary or in dichotomous cymes, the pedicels erect or recurved in fruit; hypanthium terete or compressed, globose to turbinate; calyx lobes 4, sometimes with interposed glands, remote, erect or recurved; corolla funnelform or salverform, the tube short or elongate, glabrous or pilose within, the 4 lobes valvate in bud, glabrous or pilose inside; stamens 4, inserted in the corolla throat, the filaments short or elongate; anthers dorsifixed, oblong or linear; ovary 2-celled, the style slender, with 2 linear branches; ovules few or numerous, the placentae affixed to the septum; capsule one-fourth to three-fourths superior, with few or many seeds, loculicidally dehiscent; seeds crateriform or concavo-convex, peltate.

About 35 species in North America, chiefly in the United States and Mexico. Only one species is known from Central America.

Houstonia serpyllacea (Schlecht.) C. L. Smith ex Greenm. Proc. Am. Acad. 32: 284. 1897. *Hedyotis serpyllacea* Schlecht. Linnaea 9: 599. 1834. *Mallostoma shannonii* Donn.-Sm. Bot. Gaz. 18: 203. 1893 (type from Chichoy, Chimaltenango, 2,700 m., *W. C. Shannon* 371). *Arcytophyllum shannonii* Standl. Contr. U. S. Nat. Herb. 18: 128. 1916. *Pasto de oveja* (fide Aguilar). Figure 4.

Abundant in the highlands, in pastures or meadows, often on roadside banks or on white-sand slopes, 1,700-4,200 m.; Jalapa (Montaña Miramundo); Guatemala; Sacatepéquez; Chimaltenango; Totonicapán; Sololá; Huehuetenango; Quezaltenango; San Marcos. Southern Mexico.

A creeping perennial herb, rooting at the nodes, often forming dense mats, sometimes pendent from banks, the stems often greatly elongate, hirsutulous or glabrate; stipules minute, 1-2-cuspidate, glandular-ciliate; leaves very shortly petiolate or sessile, oval to ovate-elliptic, mostly 3-6 mm. long and 2-4.5 mm. broad, acute to rounded at the apex, rounded at the base, subcoriaceous, glabrous, scaberulous-ciliate; flowers solitary in the leaf axils, the stout pedicels equaling or shorter than the calyx and capsule; hypanthium glabrous or scaberulous; calyx lobes lance-linear, 2-4 mm. long; corolla funnelform, 1 cm. long or less, white or sometimes dark reddish outside, the lobes lance-triangular, acute, about equaling the tube, hirsutulous within; capsule oblong-obovate, 4 mm. long, costate, about three-fourths inferior, obtuse at the apex; seeds rounded-oblong, concave-convex, coarsely scrobiculate.

This is one of the most abundant of plants throughout the western highlands, although an inconspicuous one. Few Guatemalan plants are represented in the country by a greater number of individuals. *Houstonia serpyllacea* grows in all parts of

the alpine meadows and in the extensive pastures where sheep feed. If one were to shut one's eyes and touch the ground anywhere in this region, it is probable that a plant of this species would be touched. It remains green through the dry months, and the stems cling so closely to the ground that apparently they are not bothered by the sheep.

ISERTIA Schreber

Trees or shrubs, more or less pubescent, with stout terete branches; leaves opposite or ternate, petiolate, coriaceous or herbaceous, large; stipules interpetiolar, 2 on each side, erect, persistent; flowers mostly large, short-pedicellate, red and yellow or sometimes white, disposed in cymes arranged in thyrsiform erect panicles, the pedicels bracteolate; hypanthium subglobose or ovoid, the calyx short, 4-6-dentate or truncate, persistent; corolla tubular-funnelform, coriaceous, the tube often costate, barbate in the throat, the limb 4-6-lobate, the short lobes valvate in bud; stamens 4-6, inserted in the corolla tube, the short filaments complanate; anthers dorsifixed, linear, acuminate, included; ovary 4-6-celled, the slender style 2-6-parted at the apex or with a thick simple stigma; ovules numerous, multiserial, the placentae affixed to the axis of the ovary; fruit small, baccate, globose or ovoid, 4-6-pyrenate, the nutlets cartilaginous, containing few or many seeds; seeds minute, subglobose, the testa crustaceous, foveolate.

A genus of about a dozen species, only two of which occur in continental North America (including the genus *Cassupa*). *I. panamensis* Standl. occurs in the Atlantic lowlands of Panama.

Isertia haenkeana DC. Prodr. 4: 437. 1830. *I. deamii* Bartlett in Rob. & Bartl. Proc. Am. Acad. 43: 59. 1907 (type from Puerto Barrios, C. C. Deam 48). *I. deamii* var. *stenophylla* Donn.-Sm. Bot. Gaz. 61: 374. 1916 (type from Costa Rica). Figure 22.

Wet thickets at or little above sea level; Izabal. Honduras, along the Atlantic coast to Panama; West Indies; Colombia.

A shrub, usually 2-3 m. high, sparsely branched, the branchlets densely sericeous with grayish or fulvous hairs; stipules linear to oblong-ovate, about 1 cm. long; petioles stout, 2.5 cm. long or less, the blades obovate to oblong-obovate, 20-45 cm. long, 8-18 cm. broad, abruptly acuminate, usually acute to attenuate at the base, membranaceous, bright green and glabrous above, somewhat paler beneath and densely short-pilose, in age sometimes glabrate; panicles erect on stout peduncles, thyrsiform, 7-20 cm. long, the lowest bracts often foliaceous, the others small, lance-linear; calyx and hypanthium 2.5-4 mm. long, puberulent or glabrous, the calyx very short, red, truncate or shallowly dentate; corolla 17-35 mm. long, yellow, sparsely or densely tomentulose outside, sometimes glabrous, the short lobes oblong or lanceolate, acute, densely barbate within; anthers 4-5 mm. long; fruit purplish, depressed-globose, 5-6 mm. broad; seeds brown, 0.8 mm. long, foveolate.

The plant is a handsome and very showy one when in flower. The inflorescences are much used about the Canal Zone for decorations.

IXORA Linnaeus

Trees or shrubs, glabrous or pubescent, the branchlets terete or angulate; stipules interpetiolar, persistent or deciduous, usually acuminate from a broad base; leaves mostly opposite, sessile or petiolate, commonly coriaceous; flowers in terminal or rarely axillary corymbs, white, pink, or red, pedicellate, the pedicels bracteolate; hypanthium ovoid, the calyx short, normally 4-lobate, persistent, the lobes short or elongate; corolla salverform, the tube slender, cylindric, the throat glabrous or pilose, the limb 4-lobate, the lobes usually short, spreading, contorted in bud; stamens 4, inserted in the throat or mouth of the corolla, the filaments very short or obsolete; anthers linear or oblong, dorsifixed, usually acuminate, erect, exserted or semiexserted; ovary 2-celled, the style filiform, exserted, with 2 short, spreading or recurved branches; ovules solitary, peltately attached to the middle of the septum; fruit baccate, globose, coriaceous or fleshy, dicarpidiate, the carpels chartaceous; seeds concavo-convex, the testa membranaceous.

A vast genus, most of the species in tropical Asia and the East Indies, but a large number in South America. Only three species are known to be native in North America, including the West Indies; and only two in Central America. One, *I. floribunda* (A. Rich.) Griseb., ranges from Honduras and El Salvador to Panama.

Leaves obtuse to subcordate at the base, sessile; corolla red*I. coccinea*.
Leaves acute to attenuate at the base, petiolate; corolla white.

Corolla tube about 30 mm. long; cultivated species.....*I. finlaysoniana*.

Corolla tube about 5 mm. long; native species.....*I. nicaraguensis*.

***Ixora coccinea* L. Sp. Pl. 110. 1753. *Argentina*.**

Cultivated commonly for ornament at low and middle elevations. Native of India.

A densely branched shrub 1-3 m. high, glabrous or nearly so; leaves sessile, oblong to suborbicular, commonly 4-9 cm. long, rounded to subacute at the apex, somewhat narrowed to the obtuse or more often cordate base; inflorescence dense and almost headlike, many-flowered, the flowers sessile or nearly so; calyx lobes triangular, acute; corolla red or orange-red, minutely puberulent or glabrate, the very slender tube 2.5-4 cm. long, the spreading lobes ovate-oblong, about 1 cm. long.

A favorite ornamental shrub in Central American gardens generally. Known in Costa Rica by the names "flor de fuego" and "jasmín."

***Ixora finlaysoniana* Wall. Cat. No. 6166. 1832, *nomen nudum*;**
G. Don, Gen. Syst. 3: 512. 1832.

Cultivated commonly for ornament, chiefly in the tierra caliente and doubtless as an escape. Native of southeast Asia.

A densely branched shrub 1-3 m. tall, glabrous throughout or nearly so; stipules rounded-ovate, short-cuspidate; leaves short-petiolate, oblong or oblanceolate-oblong, mostly 10-14 cm. long, narrowly rounded to acute at the apex, long-attenuate to the base; inflorescence dense and headlike, or sometimes of several terminal heads, with very numerous flowers, the flowers sessile; calyx lobes oblong-lanceolate, somewhat foliaceous, 2-3 times as long as the hypanthium; corolla white, the filiform tube about 3.5 cm. long, the obtuse lobes 6-7 mm. long; anthers long-exserted.

A favorite ornamental shrub in the warmer parts of Central America. In Costa Rica it is called "corona de la reina" and "moño de la reina;" "corona" and "buquet de novia" (El Salvador). It has been reported from Guatemala under the name *Ixora thwaitesii* Hook. f.

Ixora nicaraguensis Wernham, Journ. Bot. 50: 243. 1912. *I. rauwolfioides* Standl. Trop. Woods 11: 25. 1927. *Amaco* (fide Record). Figure 46.

Moist or wet lowland forest; Izabal; probably in Petén. British Honduras to Panama.

A shrub or tree 2.5-8 m. high, the trunk as much as 12 cm. in diameter, glabrous almost throughout; stipules triangular, acute, 5 mm. long; petioles stout, 4-11 mm. long, the blades elliptic-oblong or lance-oblong, 7-15 cm. long, 2-5.5 cm. broad, acute or short-acuminate, acute or acuminate at the base and decurrent, the lateral nerves about 10 on each side; inflorescence terminal, cymose-paniculate, sessile or on a peduncle 3 cm. long, much branched and many-flowered, 5-9 cm. long, the slender branches minutely puberulent, the pedicels as much as 5 mm. long; calyx and hypanthium 2 mm. long, minutely puberulent, the calyx truncate or nearly so, much shorter than the hypanthium; corolla white, glabrous, the tube 5 mm. long, the lobes oblong, spreading, rounded at the apex, 3-4 mm. long; fruit subglobose, red, about 7 mm. long, juicy.

LINDENIA Benth

Low shrubs, glabrous or pubescent, with terete branches; stipules interpetiolar, short, connate, cuspidate, persistent; leaves opposite, narrow, short-petiolate; flowers very large, in few-flowered terminal cymes, short-pedicellate, the bracts subulate; hypanthium elongate-turbinate, 5-angulate or 5-costate, the calyx 5-lobate, the lobes elongate-subulate or lanceolate, equal or unequal, persistent; corolla salverform, white, with a much elongate, terete tube, the throat naked, the limb 5-lobate, the lobes oblong, spreading, contorted in bud; stamens 5, inserted at the top of the corolla tube; anthers sessile, linear-oblong, obtuse, recurved, exserted; ovary 2-celled, the style filiform, pilose, bifid, the lobes erect; ovules very numerous, the placentae longitudinally adnate to the septum; capsule clavate or pyriform, 2-celled, septicidally bivalvate, the valves bifid, often elastically coiled after dehiscence; seeds numerous, small, angulate, smooth.

The genus consists of a single species.

Lindenia rivalis Benth. Pl. Hartw. 84. 1841. *L. acutiflora* Hook. Icon. t. 475. 1842. *Flor de María*; *jazmín de agua*. Figure 6.

Type collected on stream banks, of (Alta?) Verapaz, *Hartweg* 581. Confined to rocky stream banks, at 1,300 m. or less, chiefly in the *tierra caliente* of the two coasts, on the Pacific slope mostly along streams at the base of the hills; Petén; Izabal; Alta Verapaz; Zacapa; Escuintla; Suchitepéquez; Quiché; Retalhuleu; San Marcos. Southern Mexico to Panama.

A stiff shrub, usually 1 m. or less in height, the branches dark brown or ferruginous, usually pilosulous when young; stipules annular, 3-5 mm. long, the lobes cuspidate; leaves often crowded at the ends of the branches, on stout petioles 2-10 mm. long, oblanceolate to linear-elliptic, 5-16 cm. long, 1-2.8 cm. broad, acute to attenuate, long-attenuate to the base, almost glabrous or somewhat puberulent or pilosulous; inflorescences mostly 3-flowered cymes, the peduncles short and stout, the thick pedicels 1 cm. long or less; hypanthium 7-10 mm. long, sparsely or densely hirsutulous; calyx lobes 1-2 cm. long, green; corolla tube usually 10-16 cm. long, 2.5-3 mm. thick, pilosulous outside, the lobes elliptic to oblong-oval, 2.5-3 cm. long, acute to very obtuse; anthers 1 cm. long; capsule pyriform, 1.2-2 cm. long, costate, thick and woody, the exocarp finally separating from the endocarp; seeds 1.5-2 mm. long, brownish.

Called "lirio" in Costa Rica; the name "chilca" is reported from Honduras. A showy plant because of the large white corollas with extraordinarily long and slender tube. Few plants are so specialized in habitat as this, which, like some of the *Cuphea* and *Aster* species, is confined to rocks in or near the margins of streams where often it forms dense low thickets. During floods the shrubs often are wholly covered with rushing water. They bloom during the rainy season and we have seen none in flower during the dry months of the year.

MACHAONIA Humboldt & Bonpland

Shrubs or small trees, glabrous or pubescent, the branchlets terete, often spinose; leaves mostly opposite, sometimes ternate or fasciculate, petiolate or sessile; stipules intrapetiolar, triangular, acute or acuminate; flowers small, white or whitish, the inflorescence terminal; hypanthium turbinate or obovoid-oblong, compressed; calyx 4-5-lobate, the lobes equal or unequal, persistent; corolla small, short-funneliform, the tube short, with villous throat, the limb 4-5-lobate, the lobes rounded, imbricate, 1 or 2 of them exterior; stamens 4-5, inserted in the corolla throat, the filaments short or elongate; anthers short-oblong, dorsifixed, included or exerted; ovary normally 2-celled, the style filiform, with 2 spatulate branches; ovules solitary, pendulous from the apex of the cell; fruit small, dry, obpyramidal or oblong, laterally compressed, dicocous, the cocci indehiscent, obtusely trigonous, finally pendulous from the persistent axis; seeds cylindric, the testa membranaceous.

About 25 species in tropical America, most of them West Indian. One other species, *M. martinicensis* (DC.) Standl. (*M. rotundata* Griseb.), occurs in Central America, in Costa Rica and Panama; two others are in Mexico.

Leaves copiously pilose beneath; calyx lobes oval or orbicular, shorter than the hypanthium.....*M. acuminata*.
 Leaves glabrous beneath, barbate in the nerve axils; calyx lobes spatulate-obovate, equaling the hypanthium, much accrescent in fruit.....*M. lindeniana*.

Machaonia acuminata Humb. & Bonpl. Pl. Aequin. 1: 101, *t.* 29. 1806.

Petén (La Libertad). British Honduras; southern Mexico to Panama; southward to Ecuador and southern Brazil.

A shrub or small tree, said to be sometimes 10 m. high, the branchlets densely short-pilose or tomentulose; stipules 2-4 mm. long, setaceous-acuminate; petioles 3-10 mm. long, the blades ovate or ovate-elliptic, 5-10 cm. long, 2.5-5 cm. broad, acute or short-acuminate, rounded to subacute at the base, membranaceous, green and almost glabrous above, tomentulose beneath when young, becoming short-pilose; inflorescence much branched, paniculate, 6-10 cm. broad, the flowers sessile or subsessile, densely glomerate, the bracts very small, subulate; calyx and hypanthium 2 mm. long, the hypanthium densely white-pilose with incurved hairs; corolla white, 4-5 mm. long, sparsely puberulent, the lobes half as long as the tube; anthers exserted; fruit turbinate, 5 mm. long, puberulent.

Machaonia lindeniana Baill. Bull. Soc. Linn. Paris 1: 204. 1879. Figure 41.

Moist thickets, 300 m. or less; Petén. Mexico (Campeche and Yucatán) to British Honduras.

A shrub or tree 2-7 m. high, the trunk to 5 cm. in diameter, unarmed, the branches dark brown, coarsely lenticellate, the branchlets puberulent in 2 lines; petioles 2-4 mm. long, the blades broadly ovate to ovate-oblong or elliptic-oblong, 2-4 cm. long, 1-1.8 cm. broad, acute to obtuse at the apex, acute or obtuse at the base, short-barbate beneath in the nerve axils but elsewhere glabrous; inflorescence many-flowered, 4-7 cm. broad, the branches puberulent or glabrate, the flowers sessile to long-pedicellate, the linear bracts sometimes 8 mm. long, green; calyx and hypanthium 1.5-2 mm. long, the hypanthium sparsely pilose with short spreading hairs or glabrate, the calyx lobes spatulate-obovate, rounded at the apex, ciliolate, accrescent in age and longer than the fruit; corolla 3 mm. long, ochroleucous, glabrous, the lobes ovate, obtuse, shorter than the tube; fruit obpyramidal, 2-2.5 mm. long.

Known in Yucatan by the Maya names "cuchel" and "campocolche."

MANETTIA Mutis

Reference: Standley, Paul C., *Manettia*, in No. Am. Fl. 32: 96-100. 1921.

Scandent herbs, glabrous or pubescent; stipules short and broad, acute, sometimes adnate to the petiole; leaves opposite, petiolate, small; flowers small or large, solitary in the leaf axils or arranged in small cymes or panicles, white, red, or yellow; hypanthium turbinate to obovoid or campanulate; calyx usually 4-lobate, persistent, the lobes short or elongate, broad or narrow, often alternating with minute teeth or large lobes; corolla tubular or funnelform, with short or elongate tube, villous in the throat, the limb 4-lobate, the lobes usually short, erect or recurved, valvate in bud; stamens 4, inserted in the corolla throat, the filaments short, included or exserted; anthers versatile, oblong; ovary 2-celled, the style filiform, the stigma clavate or bifid; ovules numerous, imbricate, peltate; capsule obovoid or turbinate, bisulcate, coriaceous or chartaceous, septicidally bivalvate from the apex; seeds numerous, compressed, surrounded by a broad, irregularly dentate wing.

About 85 species in tropical America, chiefly in South America. Only one other species is known from Central America, *M. barbata* Oerst. of Costa Rica.

Calyx lobes 8 *M. reclinata*.
Calyx lobes 4..... *M. flexilis*.

Manettia flexilis Brandege, Univ. Calif. Publ. Bot. 6: 196. 1915.

Apparently scarce in Guatemala, in thickets at 1,100-1,650 m.; Alta Verapaz (Pansamalá); Quiché; Huehuetenango; Quezaltenango (Volcán de Zunil); San Marcos (southern slopes of Volcán de Tajumulco). Mexico (Chiapas, the type from Cerro del Boquerón); Costa Rica and Panama; reported, probably in error, from Ecuador.

Stems slender, puberulent or villosulous; petioles 2-6 mm. long; leaf blades ovate to lance-ovate, 3-7 cm. long, 1-3 cm. broad, acute to attenuate, acute or obtuse at the base, glabrous above or nearly so, usually short-pilose beneath along the veins; inflorescences axillary, cymose and few-flowered or sometimes 1-flowered, the pedicels 2.5 cm. long or less; hypanthium 2-3 mm. long, glabrous or pilose; the 4 calyx lobes linear to lance-ovate, 1.5-4 mm. long, recurved, usually ciliate; corolla white or rose, glabrous outside or sparsely pilose, the stout tube 6-7 mm. long, densely barbate in the throat, the lobes 2-3 mm. long; anthers subexserted; capsule 4.5-7 mm. long; seeds 2-3 mm. broad, brown.

MANETTIA LUTEO-RUBRA var. **PARAGUARIENSIS** (Chod.) Chung. (*M. inflata* Sprague). This species, native of Paraguay and

Uruguay, is well known in cultivation, and is sometimes seen in gardens of Guatemala. The corolla is 4-lobate, very densely tomentose outside, and scarlet with yellow lobes.

Manettia reclinata L. Mant. 558. 1771. *Nacibea coccinea* Aubl. Pl. Guian. 96, t. 37, f. 1. 1775. *M. cuspidata* Bert. ex Spreng. Syst. Veg. 1: 415. 1825. *M. coccinea* Willd. Sp. Pl. 1: 624. 1797. *M. seleriana* Loes. Verh. Bot. Ver. Brandenb. 65: 107. 1923 (type from Los Amates, Izabal, *Seler* 3309). *M. orbifera* Wernham, Gen. *Manettia* 41. 1919 (type from Retalhuleu, *Bernoulli & Cario* 1649). *Buquet de coral* (fide Aguilar). Figure 12.

Occasional in the tierra caliente of both coasts, ascending in the Pacific bocacosta to 1,400 m., usually growing in wet thickets; Petén; Alta Verapaz; Izabal; Santa Rosa; Escuintla; Guatamala (Fraijanes); Chimaltenango; Suchitepéquez; Retalhuleu; Quezaltenango. Southern Mexico; British Honduras to Panama; West Indies; Guianas.

Stems slender, angulate, glabrous or short-pilose, usually retrorse-pilose on the angles; stipules 1-2 mm. long; petioles 2-14 mm. long; leaf blades lanceolate to ovate, 3-10 cm. long, 1-5 cm. broad, acute or acuminate, acute or obtuse at the base, bright green above and glabrous or scaberulous, short-pilose beneath, especially along the veins, or glabrous; peduncles axillary, mostly 1-flowered, the slender pedicels 1.5-6 cm. long; hypanthium 3-5 mm. long, contracted and slightly prolonged above the ovary, glabrous or short-pilose, the 6-8 calyx lobes subequal, linear, attenuate, 4-14 mm. long, glabrous or sparsely short-pilose, recurved; corolla dull red, 17-28 mm. long, more or less pilose outside, sparsely barbate in the throat or naked, the lobes 4-5 mm. long, triangular-oblong, ovate, or suborbicular, glabrous within or nearly so; stamens included; capsule 6-10 mm. long, 6-8 mm. broad; seeds 2-3 mm. broad, the wing pale brown; the body dark brown.

Manettia reclinata was treated as a name of doubtful application by Wernham in his monograph of the genus and by the senior author in *North American Flora*. Since, however, the plant treated here agrees in all essential details with the original description of *M. reclinata*, and is the only Mexican plant known at present that does agree with it, it seems preferable to use the name *M. reclinata* for the species that has passed in recent years as *M. coccinea*. *Manettia orbifera* was maintained as a distinct species in *North American Flora*, being separated on its orbicular corolla lobes as distinguished from the ovate corolla lobes of *M. coccinea*. A phototype of *M. orbifera* has been examined and the Guatemalan specimens agree with that and the original description. *M. seleriana* is exactly equal to the common form of *M. reclinata*. In spite of its

red flowers, this, like other Central American species, is an inconspicuous plant, in no way comparable in beauty with the South American members of the genus that sometimes are cultivated.

MITCHELLA Linnaeus

Perennial creeping herbs, glabrous or puberulent; stipules interpetiolar, minute; leaves opposite, short-petiolate, ovate-rounded; inflorescence axillary and terminal, flowers small, white, ebracteate, geminate and connate at the apex of the peduncle; hypanthium ovoid, the calyx 3-6-dentate, persistent; corolla funnelform, barbate in the throat, the limb 3-6-lobate, the lobes barbate within, recurved in anthesis, valvate in bud; stamens 3-6, inserted in the corolla throat, with stout filaments; anthers dorsifixed near the base, oblong, exserted; ovary 4-celled, the style filiform, with 4 short filiform hirsute branches; ovules solitary, erect from the base of the cell; fruit of 2 connate drupes, containing 8 nutlets, these osseous, obtusely trigonous.

One other species is known and that in Japan.

Mitchella repens L. Sp. Pl. 111. 1753. Figures 53.

Zacapa, pine forest, Sierra de las Minas, 1,700-2,000 m. Southern Mexico; eastern Canada and central and eastern United States. Figure 53.

Stems slender, rooting at the nodes, 30 cm. long or less, glabrous or nearly so; leaves on rather long petioles, broadly ovate to ovate-orbicular, mostly 1-3 cm. long, obtuse to acute, at the base rounded or shallowly cordate, dark green and lustrous above, slightly paler beneath, glabrous; peduncles shorter than the leaves, bearing at the apex 2 sessile white flowers; calyx teeth triangular, acute; corolla about 1 cm. long; fruit bright red, 5-8 mm. broad, long-persistent.

Called "partridge berry" and "twin berry" in the United States, where the plant often is used for winter holiday decorations. In the winter state it is attractive because of the abundant bright-colored berries. The leaves persist through the winter, retaining their green color. The plant is exceedingly rare in tropical America. We have seen only one collection from Mexico and two from Guatemala.

MITRACARPUS Zuccarini

Erect or prostrate, annual or perennial herbs with more or less tetragonous stems; stipules connate with the petioles to form a setiferous sheath; leaves opposite, herbaceous, linear to ovate; flowers very small, white, crowded in dense terminal heads, these usually subtended by 4 leaflike bracts; hypanthium turbinate to subglobose; calyx of 4-5 narrow teeth, persistent; corolla salverform or funnelform, the tube usually with a ring of hairs inside, the throat naked or villous, the limb 4-lobate, the lobes spreading in anthesis, valvate in bud; stamens 4, inserted in the corolla throat, the anthers dorsifixed, oblong or linear, included or exserted; ovary 2-

celled, the style short or elongate, with 2 short linear branches; ovules solitary, affixed peltately to the middle of the septum; fruit didymous, membranaceous, circumscissile at or below the middle, the upper portion separating with the calyx and exposing the seeds, the septum persistent with the basal portion; seeds oblong or globose, the ventral surface plane.

About 30 species in tropical America and Africa. No other species are known from Central America, but numerous representatives of the group occur in South America.

Plants perennial, with numerous stems from a somewhat woody base.

M. rhadinophyllus.

Plants annual, usually simple at the base.....*M. hirtus*.

Mitracarpus hirtus (L.) DC. Prodr. 4: 572. 1830. *Spermacoce hirta* L. Sp. Pl. ed. 2. 148. 1762. *M. breviflorus* Gray, Pl. Wright. 2: 68. 1853. Figure 66.

Common and widely distributed, usually as a weed in waste or cultivated ground, sometimes in pastures, on open banks, or in thickets, ascending to 1,900 m., but most common at lower elevations, especially on the coastal plains; Alta Verapaz; Izabal; Zacapa; Jalapa; Jutiapa; Sacatepéquez; Chimaltenango; Quiché; Huehuetenango; Escuintla; Suchitepéquez; doubtless in most of the other departments as well. Southwestern United States to Panama, and southward through the greater part of South America.

Plants annual, generally erect, simple or sometimes much branched, commonly 30-60 cm. high, the stems relatively stout, villous or puberulous, especially at the nodes, sometimes glabrate or almost wholly glabrous; setae about equaling the stipular sheath; leaf blades oblong to linear-lanceolate, mostly 2-5 cm. long, sometimes longer, obtuse or acute, narrowed at the base into a short petiole or subsessile, rough and scaberulous on the upper surface, villosulous or glabrate beneath; flower heads about 1 cm. in diameter, terminal and axillary, the terminal ones subtended by large leaflike bracts; hypanthium pilose, the calyx teeth subulate, pilose; corolla white, about 2.5 mm. long; capsule hardly 1 mm. long, circumscissile near the middle; seeds pale brown, minutely pitted.

At least one collection of this plant was reported by Captain Smith from Alta Verapaz under the name *Spermacoce latifolia* Aubl.

Mitracarpus rhadinophyllus (Rob.) L. Wms. Fieldiana, Bot. 29: 371. 1961. *M. villosus* var. *glabrescens* Griseb. Cat. Pl. Cub. 143. 1866. *Borreria rhadinophylla* Rob. Proc. Am. Acad. 45: 409. 1910 (type from British Honduras, Peck 180). *M. glabrescens* Urban, Symb. Antill. 7: 551. 1913.

Pine ridges of British Honduras, and doubtless extended into Petén or Alta Verapaz. Western Mexico; Nicaragua; Cuba.

Plants perennial, erect, 60 cm. high or less, glabrous almost or quite throughout, the stems sometimes short-pilose at the nodes; stipule sheaths with usually 3 setae 6 mm. long or less; leaves narrowly lanceolate to almost linear, 3-9 cm. long, 1 cm. broad or usually much narrower; fruiting heads about 1 cm. thick; lateral sepals 2-2.5 mm. long, narrowly lanceolate, acute; corolla white, 3.5 mm. long, the lobes half as long as the tube, glabrous.

Mexican specimens of this species have been determined at Kew as *M. schizangium* DC., which was described from Mexico. In spite of De Candolle's description of *M. schizangium* as a perennial, a photograph of the type indicates that probably it is *M. hirtus*, and it is certainly not the plant here treated as *M. rhadinophyllus*. The type consists of the upper part of a stem and there is no obvious basis for ascribing a perennial habit to the plant.

MORINDA Linnaeus

Shrubs or trees, erect or often scandent, glabrous or pubescent, the branches terete or obscurely tetragonous; stipules connate with the petioles to form a sheath; leaves opposite or ternate, herbaceous; flowers perfect, white, connate by the calyces to form a dense head, the heads pedunculate, axillary or terminal, commonly solitary; hypanthium urceolate or hemispheric, the calyx short, truncate or obscurely dentate, persistent; corolla funnelform or salverform, the tube short, the throat glabrous or pilose, the limb 5-lobate, the lobes valvate in bud, coriaceous; stamens 5, inserted in the corolla throat, with short filaments; anthers dorsifixed, linear or oblong, obtuse, included or exserted; ovary normally 2-celled or 4-celled, the style included or exserted, glabrous or pilose, with 2 short or elongate, linear branches; ovules solitary, affixed to the septum below the middle, ascending; fruit a syncarp, succulent, containing numerous nutlets, these cartilaginous or osseous, 1-seeded; seeds obovoid or reniform.

About 50 species, chiefly in the Old World tropics, only a few known from America. No other species have been found in Central America.

Leaves short-pilose or scaberulous beneath.

Leaves short-pilose beneath, mostly 2-4 cm. broad; rough on the upper surface.

M. yucatanensis.

Leaves merely scaberulous beneath, 4-7 cm. broad, smooth on the upper surface.

M. asperula.

Leaves glabrous beneath, sometimes barbate in the axils of the nerves.

Leaves elliptic, mostly 5-9 cm. broad; corolla 15 mm. long.....*M. panamensis*.

Leaves mostly oblong or lance-oblong and 1.5-5 cm. broad; corolla 7-10 mm. long.

M. royoc.

Morinda asperula Standl. Field Mus. Bot. 22: 54. 1940.
Belicia hoffmannioides Lundell, Contr. Univ. Mich. Herb. 8: 87. 1942
(type from British Honduras, *Gentle 3945*).

In mixed forest or in pine forests, the type collected by *Standley 72368* near Quiriguá, Izabal. Mexico (Chiapas on Atlantic side); British Honduras.

A shrub or tree 3-8 m. high, the trunk reported to attain a diameter of 35 cm. in Chiapas, the branchlets densely and minutely scaberulous; stipules broadly oval-ovate, 10-14 mm. long, broadly obtuse or rounded at the apex; petioles 5-10 mm. long or more elongate, the blades subelliptic or oblong-elliptic, 11-18 cm. long, 4-7.5 cm. broad, acuminate or long-acuminate, acute at the base, glabrous above or nearly so and smooth to the touch, densely and minutely scaberulous beneath, rough to the touch, densely barbate in the nerve axils; peduncles 1.5 cm. long or shorter, the flower heads (excluding the corollas) 8 mm. in diameter; calyx truncate, minutely puberulent; corolla white, 1 cm. long, densely puberulent; fruit about 1.5 cm. in diameter.

Closely related to *M. panamensis*, but differing in pubescence and in the smaller corollas. The type specimen of *Belicia hoffmannioides*, the type of the genus *Belicia*, is in fruit and also bears flower buds. It differs somewhat from other material of the species in having the inflorescences sessile or on very short peduncles. It is believed, however, that it is only an individual variant of *Morinda asperula*.

Morinda panamensis Seem. Bot. Voy. Herald 136. 1854.
Canche (Alta Verapaz).

Swamps, pastures, and thickets, 500 m. or lower; Alta Verapaz; Izabal. Mexico (Oaxaca and Tabasco); British Honduras along the Atlantic coast to Panama; Colombia.

An almost glabrous shrub or tree, 6 m. tall or less, the trunk 10 cm. or more in diameter; stipules 1 cm. long or larger, rounded or very obtuse at the apex; leaves short-petiolate, blackish when dried, elliptic or oblong-elliptic, 10-18 cm. long, 4-10 cm. broad, acute or acuminate, barbate beneath in the axils of the nerves, elsewhere glabrous or nearly so, smooth to the touch; peduncles stout, 1-3 cm. long, the heads 6-8 mm. in diameter; corolla white or pinkish, 1.5 cm. long, glabrous outside or nearly so; fruiting heads 1-1.5 cm. in diameter, greenish.

The flowers are sweet-scented. The bark is thin and dark brown, the wood deep yellow, moderately hard. In the Isthmus of Tehuantepec it is used for railroad ties. Vernacular names reported are "yellow-wood" and "turkey victuals" (British Honduras); "palo de peine" (Tabasco); "calabaza" (Oaxaca); "concha de huevo" (Honduras).

Morinda royoc L. Sp. Pl. 176. 1753.

Collected at various stations in British Honduras, and doubtless extending into Petén, perhaps also into Izabal. Nicaragua; Panama; West Indies; Colombia and Venezuela.

An erect or clambering shrub, sometimes climbing to a height of 6 m., with slender branches; stipules caudate from a broad base, about 2 mm. long; petioles 5-8 mm. long, the blades linear-lanceolate to lance-oblong, commonly 5-9 cm. long and 1-2.5 cm. broad, sometimes larger, acute, narrowed to the base, barbate beneath in the nerve axils, otherwise glabrous or practically so; peduncles 2-5 mm. long, the heads about 1 cm. in diameter, few-flowered; hypanthium 3 mm. long, the calyx one-third as long; corolla white or pinkish, about 8 mm. long; anthers short-exserted; fruit globose, sometimes as much as 2 cm. broad but usually smaller.

Morinda yucatanensis Greenm. Field Mus. Bot. 2: 262. 1907.
Piñuela. Figure 58.

Petén and Izabal, at or little above sea level, in pine forest or savannas, usually on limestone. Extending to British Honduras, Mexico (Yucatan and Campeche).

A shrub, erect or spreading or clambering, the branchlets hirtellous; stipules 3 mm. long, cuspidate from a broad base; leaves short-petiolate, lance-oblong to narrowly lanceolate or oblong-elliptic, mostly 6-10 cm. long and 1.5-4 cm. broad, acute or acuminate, acute at the base, minutely scaberulous and rough on the upper surface, hirtellous or short-pilose beneath, often barbate in the nerve axils; peduncles short or none, the heads about 1 cm. in diameter; hypanthium and truncate calyx densely hirtellous; corolla white, minutely hirtellous, scarcely more than 5 mm. long; fruit yellowish at maturity, 1-1.5 cm. in diameter, juicy.

The Maya names are reported as "xhoyoc," "hoyoc," "xoyencab" and "xhoyac." The plant is said to have been used by the Mayas of Yucatan for dyeing. The fruits are rubbed on warts to remove those growths.

NERTERA Banks & Solander

Slender creeping perennial herbs, rooting at the nodes, glabrous or sparsely pilose; stipules minute, connate with the petioles to form a sheath, 2-dentate or entire; leaves small, opposite, sessile or petiolate, ovate-lanceolate to rounded-ovate; flowers minute, axillary, sessile, mostly perfect; hypanthium ovoid, the calyx truncate or short-tubular and 4-5-dentate, persistent; corolla tubular or funnelform, with glabrous throat, the 4 lobes valvate in bud; stamens 4, inserted at the base of the corolla, the filaments filiform; anthers basifixed, oblong, apiculate, exserted; ovary 2-celled, the style branches 2, distinct at the base, filiform, long-exserted, pilose; ovules solitary, erect from the base of the cell; fruit red, drupaceous, juicy, ovoid or globose, containing 2 nutlets, these plano-convex, cartilaginous.

Half a dozen species are known, in the mountains of Hawaii, the East Indies, Australia, New Zealand, and in America from Mexico to southern South America. In America a single species is known, confined to temperate regions of the tropical mountains. The generic name *Nertera* has been conserved over *Gomozia* of Mutis.

Nertera granadensis (L. f.) Druce, Bot. Exch. Club of British Isles, Rept. of 1916: 637. 1917. *Gomozia granadensis* L. f. Suppl. Pl. 129. 1781. *Nertera depressa* Banks & Sol. in Gaertn. Fruct. et Sem. Pl. 1: 124. 1788. *Hiedrilla* (fide Aguilar).

Widely distributed in the higher mountains, 2,000-3,400 m., usually on banks in dense forest, often among mosses, most plentiful in damp cold coniferous forests, especially those of *Cupressus*, sometimes in alpine meadows; El Progreso; Zacapa (Sierra de las Minas); Jalapa; Guatemala (Volcán de Pacaya); Chimaltenango; Sololá; Quiché; Huehuetenango; Totonicapán; Quezaltenango; San Marcos. Central Mexico to Panama; extending far southward along the Andes of South America.

Plants creeping and often forming dense mats, almost glabrous, the stems much branched, rooting at the nodes; leaves mostly about 5 mm. long and often slightly wider, slender-petiolate, ovate to ovate-rounded, obtuse, punctulate above; corolla very small, white, inconspicuous; berries 3-4 mm. long, orange-red or bright red, juicy.

A rather handsome plant when covering mossy banks or old logs. In general appearance it much resembles *Mitchella repens*, but is smaller in all parts.

OLDENLANDIA Linnaeus

Small, annual or perennial herbs, mostly dichotomous-branched, glabrous or pubescent; stipules small, acute or acuminate, sometime setiferous; leaves opposite, sessile or petiolate, herbaceous; flowers small, in dichotomous, axillary and terminal panicles or cymes, or sometimes solitary in the leaf axils; hypanthium turbinate or subglobose, the calyx 4-parted, the lobes usually erect and remote in fruit; corolla rotate or funnelform, the tube short or elongate, the throat usually glabrous, the limb 4-lobate, the lobes obtuse, valvate in bud; stamens 4, inserted in the corolla throat, with short filaments, the anthers dorsifixed, generally exserted; ovary 2-celled, the style slender, with 2 short linear obtuse branches; ovules numerous, rarely few, the placentae attached at the base or rarely at the middle of the septum; capsule small, usually membranaceous, terete or angulate, globose or turbinate, loculicidally dehiscent at the apex or through its whole length, few-seeded; seeds angulate or subglobose, the testa smooth or minutely granulate.

Eighty or more species in tropical regions, chiefly in the Old World. About 13 are known from North America.

- Flowers solitary in the leaf axils on long slender pedicels *O. herbacea*.
 Flowers in few-flowered, axillary or terminal cymes.
 Corolla inconspicuous, about 1 mm. long; plants annual *O. corymbosa*.
 Corolla evident, 5-6 mm. long; plants perennial *O. microtheca*.

Oldenlandia corymbosa L. Sp. Pl. 119. 1753. Figure 3.

Izabal (weed in lawn at Quiriguá, alt. 70 m.); British Honduras, and perhaps occurring in Petén. Southward to Panama and through most of South America; tropical regions of the Old World.

An erect or decumbent annual, glabrous except on the leaf blades, usually much branched, the branches 10-30 cm. long; stipules 1-1.5 mm. long, whitish, truncate, bearing 1 or more long setae; leaves sessile or subsessile, linear or linear-lanceolate, 1-3.5 cm. long, 1-5 mm. broad, acute to attenuate, usually scaberulous on the upper surface, pale beneath, 1-nerved; cymes mostly 3-flowered, the filiform pedicels 5-15 mm. long, often recurved; hypanthium less than 1 mm. long, the calyx lobes usually longer, triangular-acuminate; corolla white or pale lavender, short-salverform, equaling or slightly exceeding the calyx lobes; capsule subglobose, 1.5-2 mm. broad and almost as long; seeds 0.2-0.3 mm. long, brown.

The plant often grows in sandy soil under coconut palms along or near the seashore.

Oldenlandia herbacea (L.) DC. Prodr. 4: 425. 1830. *Hedyotis herbacea* L. Sp. Pl. 102. 1753.

A weedy plant, usually growing in wet soil near streams, sometimes on open banks or gravel bars, or along seashores, usually at or little above sea level, but ascending in Chiquimula to 1,500 m.; Izabal; Chiquimula (southeast of Concepción de las Minas); Santa Rosa; San Marcos. Southern Mexico to Panama, South America, and West Indies; Africa; India; East Indies.

An erect or procumbent annual, glabrous throughout, usually much branched, the stems commonly 20 cm. long or less; stipules 2-3 mm. long, 2-3-cuspidate; leaves sessile, spreading or reflexed, usually linear, 2-7 cm. long, 1-8 mm. broad, long-attenuate or acute, pale beneath, 1-nerved; flowers axillary, mostly solitary, on filiform pedicels 8-25 mm. long, usually reflexed in fruit; hypanthium 1.5 mm. long, the calyx lobes about as long, lance-acuminate, distant in fruit; corolla salverform, white, about as long as the calyx lobes; capsule depressed-globose, 2.5-3 mm. long, 3-4.5 mm. broad; seeds minute, pale brown, finely reticulate.

Both this and the preceding species appear to be of sporadic occurrence in Guatemala, as elsewhere in Central America. They are both inconspicuous and weedy plants.

Oldenlandia microtheca (Schlecht. & Cham.) DC. Prodr. 4: 428. 1830. *Gerontogea microtheca* Schlecht. & Cham. Linnaea 5: 169. 1830.

Moist or wet, rocky places, sometimes, at least, on limestone, 300-1,150 m.; Alta Verapaz (near Cubilgüitz); Huehuetenango (Finca Soledad, southeast of Barillas). Southern Mexico.

A very slender perennial, erect or decumbent, sometimes rooting at the lower nodes, 10-40 cm. high, branched, the stems glabrous or puberulent at the nodes; stipules 1-2 mm. long, the margins fimbriate, the lobes mostly gland-tipped; leaves on short slender petioles, ovate or lanceolate, 1-4.5 cm. long, acute or attenuate, acute or acuminate at the base, glabrous or scaberulous on the upper surface, slightly paler beneath, glabrous or scaberulous; flowers in terminal and axillary cymes, the cymes slender-pedunculate, few-flowered, lax, the pedicels 3-12 mm. long, filiform, glabrous; hypanthium less than 1 mm. long, the calyx lobes as long or longer, triangular-lanceolate; corolla 5-6 mm. long, white, the lobes much shorter than the tube, papillose inside; style exserted; capsule hemispheric, 2 mm. long and slightly broader, glabrous; seeds minute, angulate, brownish black.

PALICOUREA Aublet

Shrubs or small trees, glabrous or pubescent; stipules persistent, small or large, usually united below to form a short sheath, bilobate, the lobes broad or narrow, erect; leaves opposite or ternate, petiolate, usually somewhat coriaceous; flowers small, cymose, corymbose, or paniculate, the panicles often thyrsiform, the inflorescence terminal, its branches usually colored or pale, often yellow or reddish; calyx small, dentate; corolla tubular, with very short lobes, the tube usually elongate and slightly curved, generally somewhat dilated on one side at the base; ovary 2-celled, the style simple, with 2 short branches, the cells 1-ovulate, the ovules attached basally, erect; fruit drupaceous, commonly 2-celled, containing 2 nutlets, these coriaceous, costate dorsally, plane or excavate on the inner surface.

A large and difficult genus with perhaps more than 250 species, most abundant in the Guayana highlands and adjacent regions of South America. There are about 30 species in North America, most of them in Costa Rica.

Leaves ternate, rough to the touch on both surfaces.....*P. triphylla*.

Leaves opposite, smooth.

Corolla puberulent.

Inflorescence thyrsoid-paniculate; leaves mostly 7-14 cm. broad; corolla yellow or orange.....*P. guianensis*.

Inflorescence corymbiform; leaves mostly 2-4 cm. broad; corolla white.....*P. seleri*.

Corolla glabrous.

Corolla white or whitish.

Calyx usually much longer than the hypanthium; corolla 15-16 mm. long.

P. leucantha.

Calyx shorter than the hypanthium; corolla about 20 mm. long..*P. macrantha*.

Corolla orange or orange-yellow.

Corolla about 8 mm. long; stipular sheath very short, shorter than the lobes.

P. crocea.

Corolla 12-15 mm. long; stipular sheath well developed, usually equaling or longer than the lobes *P. galeottiana*.

***Palicourea crocea* (Swartz) R. & S. Syst. Veg. 5: 193. 1819.**

Psychotria crocea Swartz, Prodr. Ind. Occ. 44. 1788.

Wet forest or thickets of Petén and the North Coast, at or little above sea level; Petén (La Libertad); Izabal. Mexico (Campeche, Tabasco), and British Honduras to Panama, southward to Bolivia; West Indies.

A shrub or small tree 1-5 m. tall, glabrous or nearly so, the branches green, subterete or obtusely quadrangular; stipules only 2-3 mm. long; leaves opposite, on petioles 5-15 mm. long, ovate-lanceolate to lance-oblong or elliptic-oblong, 6-17 cm. long, 2.5-6.5 cm. broad, acuminate or long-acuminate, acute or attenuate at the base, with 8-12 pairs of lateral nerves; panicles mostly 5-10 cm. long and 3-5 cm. broad, thyriform, the branches reddish, suberect or strongly ascending, the bracts filiform, the pedicels slender, usually longer than the calyx, dark orange; calyx slightly shorter than the hypanthium, less than 1 mm. long, the lobes rigid, with thick margins, ovate or lanceolate-ovate, acute; corolla red or orange-red, about 8 mm. long, the lobes 1.5 mm. long; fruit ovoid, purple-black, 4.5 mm. long.

***Palicourea galeottiana* Mart. Bull. Acad. Brux. 11, pt. 1: 136. 1844; L. Wms. Phytologia 26: 492. 1973. *Psychotria mexicana* Willd. ex Roem. & Schult. Syst. Veg. 5: 189. 1819. *Palicourea mexicana* Benth. ex Oerst. Vid. Medd. Kjoebenhavn 1852: 37. 1853, not *Psychotria mexicana* Willd. *Raxcuac* (Alta Verapaz, Quecchí); *chalchipin* (fide Aguilar). Figure 49.**

Widely distributed in the mountains, usually in wet, mixed or pine forest, sometimes in thickets, 800-2,400 m., common in the western highlands; Alta Verapaz; Baja Verapaz; Zacapa; Chiquimula; reported from Sacatepéquez; Chimaltenango; Sololá; Suchitepéquez; Quiché; Huehuetenango; Quezaltenango; San Marcos. Southern Mexico; Honduras to Panama.

A shrub or small tree 2-7 m. high or sometimes even larger, glabrous throughout or nearly so, the branches slender, subterete, green; stipules short, the lobes short or elongate, narrowly triangular to subulate, often much shorter than the tube; leaves stiff, short-petiolate, oblong or elliptic-oblong, 7-20 cm. long, 3-6 cm. broad, acuminate, acute at the base, usually almost glabrous but more or less pilose along the costa; panicles thyriform or corymbiform, usually almost as broad as long, dense or lax and many-flowered, the branches dull red or yellowish, most of the flowers slender-pedicellate; calyx lobes scarcely 1 mm. long, rounded and usually with thin, undulate or irregular margins; corolla pale yellow or bright yellow, commonly 12-15 mm. long, glabrous; fruit purple-black, ovoid, about 5 mm. long.

This is a rather handsome and showy shrub or small tree, particularly abundant in the pine forests of Cobán, and almost equally so in the wet mixed forests of Quezaltenango and San Marcos. *Palicourea mexicana* "form. vel var." *angustifolia* Loes. (Verh. Bot. Brandenb. 65: 113. 1923; type collected between Trinidad and Rosario, Distr. Nentón, *Seler* 3048) is described as having lanceolate or elliptic-lanceolate leaves, but from description does not appear to be essentially different from the usual form of *P. galeottiana*.

Palicourea guianensis Aubl. Pl. Guian. 173, t. 66. 1775. *Psychotria guianensis* Rusby, Mem. Torr. Bot. Club 3, pt. 3: 48. 1893. *Bitcul* (Petén, Maya, fide Lundell).

Wet forest or thickets, lowlands of Petén and Alta Verapaz, 350 m. or less; doubtless also in Izabal. Mexico to Brazil at low elevations.

An almost glabrous shrub or small tree, commonly 2-3 m. high, the branches stout, subterete, constricted at the nodes when dry; stipules 8-10 mm. long, biparted, the lobes lanceolate or ovate, obtuse; leaves opposite, large, on short stout petioles, rather thin, elliptic-oblong to ovate or elliptic, 16-30 cm. long, 7-14 cm. broad, acuminate, acute to almost rounded at the base, glabrous or nearly so; panicles thyriform, dense and many-flowered, long-pedunculate, usually about 10 cm. long and 7 cm. broad, the stout branches ascending or spreading, glabrous or puberulent, the bracts subulate, inconspicuous, the flowers pedicellate; calyx lobes minute, deltoid, obtuse or acute; corolla deep yellow or orange-red, 10-18 mm. long, densely and minutely furfuraceous-tomentulose or glabrate; fruit juicy, purplish black, ovoid, 4-5 mm. long.

Palicourea leucantha Donn.-Sm. Bot. Gaz. 48: 295. 1909.

Moist or wet, mountain forest, 1,500-2,000 m.; endemic; Alta Verapaz (type collected along the road between Cobán and Tactic, *Tuerckheim* 8400); Huehuetenango (Sierra de los Cuchumatanes).

An almost glabrous shrub 3 m. high, the branches obtusely tetragonous; stipule lobes linear-lanceolate, 4-5 mm. long, about equaling the sheath; leaves on petioles 1.5-3 cm. long, opposite, elliptic-oblong, 14-17 cm. long, 4-7 cm. broad, acuminate at each end, minutely puberulent or glabrous beneath; inflorescence thyriform, 13-18 cm. long, 5-7 cm. broad at the base, the bracts and bractlets linear-lanceolate, 4-9 mm. long, the pedicels 3-9 mm. long; calyx lobes unequal, oblong-ovate, 2-4 mm. long, 3-nerved, much longer than the hypanthium, at least in anthesis; corolla white, 15-16 mm. long; anthers 2 mm. long.

Palicourea macrantha Loes. Verh. Bot. Ver. Brandenb. 65: 113. 1923.

Type from Huehuetenango, wet virgin forest near Yalambohoch, Distr. Nentón, *Seler* 2871.

A glabrous shrub, the branches subterete; stipules scarcely 2 mm. long, equaling the sheath, deltoid, subobtusate; leaves opposite, on petioles 1.5-3 cm. long, oblong, lance-oblong, or elliptic-oblong, 13-18 cm. long, 3.5-6.5 cm. broad, acuminate or acute, cuneate at the base, the lateral nerves 10-14 on each side; inflorescence corymbiform, about 10 cm. long, on a peduncle 7 cm. long, the pedicels 6-10 mm. long, pale yellow; hypanthium 2 mm. long, the calyx cupular, 1.5 mm. long, 5-dentate; corolla whitish, almost 2 cm. long, the lobes 3 mm. long.

Palicourea seleri Loes. Verh. Bot. Ver. Brandenb. 65: 114. 1923.

Wet mixed mountain forest, 2,800-3,000 m. or lower; Chimaltenango (Santa Elena); Huehuetenango (types collected in Distr. Nentón, near Yalambohoch and between Trinidad and Rosario, *Seler* 2676, 3049); San Marcos (Volcán de Tacaná). Mexico (Chiapas).

A shrub or small tree, 4.5 m. high or less, apparently densely branched, the branchlets terete, densely puberulent or glabrate; stipules 2-5 mm. long, puberulent, the lobes subulate; leaves small, on petioles 5-17 mm. long, oblong-lanceolate to ovate-lanceolate or lanceolate, 6-15 cm. long, 1.5-4 cm. broad, acuminate or acute, acute at the base or attenuate, thin, puberulent above along the costa, deep green, paler beneath, densely puberulent on the costa and veins, the lateral nerves about 10 pairs; inflorescence cymose, as broad as long or broader, lax, with few or many flowers, the branches puberulent or pilosulous, the bracts linear, 1 cm. long or less, the pedicels 1-2 cm. long or shorter; hypanthium scarcely 1 mm. long, minutely puberulent, the calyx cupuliform, 0.5 mm. long, 5-dentate; corolla 9-11 mm. long, lavender and white outside, white within, puberulent, the ovate lobes 1.5 mm. long; fruit about 4 mm. long.

Palicourea triphylla DC. Prodr. 4: 526. 1830. *Psychotria triphylla* Muell.-Arg. in Mart. Fl. Bras. 6, pt. 5: 233, t. 32. 1881.

Wet thickets at or little above sea level, north coast, sometimes in *Manicaria* swamps or at the edges of savannas; Alta Verapaz; Izabal. British Honduras, southward along the Atlantic coast to Panama, and extending to Bolivia and Brazil.

A stout shrub 1-3 m. high, the branches terete, glabrous or nearly so; stipule lobes linear, 6-10 mm. long; leaves large, ternate, on very short, stout petioles, oblong or obovate-oblong, mostly 10-23 cm. long and 4-7 cm. broad, long-acuminate, commonly acute at the base, puberulent, especially beneath, or finally glabrate, rough to the touch; inflorescence long-pedunculate, thyrsoid-paniculate, dense and many-flowered, 6-11 cm. long or larger, short-pilose, the bracts linear-subulate, the branches orange or yellowish; flowers pedicellate, the calyx red, its teeth obtuse; corolla yellow, furfuraceous-puberulent, 12-15 mm. long; fruit purple-black, ovoid, 5 mm. long.

PENTAGONIA Bentham

Shrubs or small trees simple or branched, the branchlets terete or obtusely tetragonous, glabrous or pubescent; leaves large, opposite, sessile or petiolate, coriaceous, entire or pinnatifid, finely striolate-lineolate between the veins, the petioles sometimes auriculate; stipules large, elongate, deciduous; inflorescence axillary, sessile or pedunculate, cymose-corymbose, with few to many flowers, the flowers large, red or yellow, bracteate; hypanthium turbinate or campanulate; calyx spathaceous or 5-6-lobate, persistent, the lobes equal or unequal, obtuse; corolla funnelliform or tubular, coriaceous, the tube glabrous within or villous at the base of the stamens, the throat glabrous, the limb 5-6-lobate, with short valvate lobes; stamens 5-6, inserted below the middle of the corolla tube, the filaments equal or unequal, usually villous at the base; anthers dorsifixed, ovate or oblong, obtuse, included; ovary 2-celled; style included, its branches linear-oblong, obtuse; ovules numerous, the placentae adnate to the septum; fruit baccate, subglobose, thick, 2-celled; seeds numerous, obtusely angulate, with thin testa.

About 20 species in tropical America. Eight are known from Central America, chiefly in Panama and Costa Rica. The genus is noteworthy for the very large leaves, which exhibit a fine striolation on both surfaces in the dry state. In some species the blades are deeply pinnatifid, a condition occurring regularly in no other American genus of the Rubiaceae. The young leaves and the large caducous stipules often are brilliantly colored in shades of red or purple.

Pentagonia macrophylla Benth. Bot. Voy. Sulph. 105, *t.* 39. 1845. *Watsonamra macrophylla* Kuntze, Rev. Gen. 302. 1891. *W. donnell-smithii* Standl. Contr. U. S. Nat. Herb. 17: 442. 1914. *P. donnell-smithii* Standl. Journ. Wash. Acad. Sci. 17: 170. 1927. Figure 27.

Dense wet forest, at or little above sea level; Izabal. Ranging southward to Panama.

A shrub or tree, sometimes 9 m. high, simple or branched, the branchlets stout, finely sericeous or glabrate; stipules ovate, about 5 cm. long and half as broad, acuminate or attenuate, sericeous outside, glabrous within; petioles naked, 5-9 cm. long, the blades oval to oblong-elliptic, 15-55 cm. long and 10-30 cm. broad or even larger, acute, attenuate to rounded and short-decurrent at the base, glabrous above, minutely sericeous beneath along the veins; cymes dense, sessile or short-pedunculate, with few to many flowers, the thick pedicels 4-6 mm. long, tuberculate, bracts caducous; hypanthium 6-8 mm. long, densely sericeous; calyx 1-1.5 cm. long, the lobes oval or suborbicular, rounded or obtuse at the apex; corolla yellow, minutely sericeous outside, the tube 2.5 cm. long, 2.5-6 mm. broad, the lobes lance-oblong to broadly ovate, 5-7 mm. long, acute or acutish; fruit globose, 2.5 cm. in diameter.

PINAROPHYLLON Brandegee

Low perennial herbs, sometimes suffrutescent at the base, pubescent; stipules foliaceous, deciduous; leaves opposite, short-petiolate, membranaceous; flowers small,

ebracteolate, the inflorescence axillary, the peduncles filiform, unilaterally few-flowered; hypanthium turbinate; calyx 4-lobate, the lobes subequal, persistent; corolla yellow or yellowish or purplish, subrotate, with very short tube, the throat glabrous, the limb 4-lobate, the lobes spreading in anthesis, imbricate in bud, acute; stamens 4, inserted at the base of the corolla tube; filaments short, compressed, the anthers exserted, oblong-linear, dorsifixed near the base, obtuse; ovary 2-celled, the style filiform, elongate, the stigma clavate or bilobate; ovules numerous, the placentae peltately affixed to the septum; capsule small, turbinate or oblong-turbinate, costate, membranaceous, dehiscent at the apex; seeds numerous, minute, globose, punctate.

The genus consists only of the two species described here.

Inflorescence several-flowered, secund; leaf acuminate *P. flavum*.
 Inflorescence mostly 1-flowered; leaf obtuse or acute *P. bullatum*.

Pinarophyllon bullatum Standl. N. Am. Fl. 32: 87. 1921.
Hoffmannia pusilla L. Wms. Fieldiana, Bot. 34: 117. 1972 (type from Alta Verapaz, *Pittier 348*).

Alta Verapaz, 750-1,100 m. on limestone rocks in wet forest, endemic; type collected between Sepacuité and Secoyocté, *H. Pittier 348*.

A small perennial, the stout stems 3-12 cm. long, erect or ascending, usually simple, densely villous with long weak hairs, densely leafy at the apex; petioles 1 cm. long or less; leaf blades obovate to oblanceolate, 3-8 cm. long, 1-2.5 cm. broad, subacute to rounded at the apex, attenuate to the base, conspicuously bullate, green above and sparsely long-villous, paler beneath and copiously villous along the veins with weak multicellular hairs; peduncles numerous, filiform, flexuous, mostly 1-2-flowered, the pedicels to 15 mm. long; hypanthium sparsely villous, narrowly turbinate, 2 mm. long; calyx lobes 4 or 5, narrowly triangular, acute, about 1 mm. long; corolla 3-4 mm. long, glabrous, described as purplish, the lobes lance-oblong, acute; capsule narrowly oblong-turbinate, 5-7 mm. long, costate and striolate; seeds minute, dark brown.

Pinarophyllon flavum Brandege, Univ. Cal. Publ. Bot. 6: 71. 1914. Figure 9.

Wet and shaded ravines, 500-1,000 m. (type from Chiapas, *Purpus 6700*) Mexico, to be expected in Guatemala.

Small perennial herbs 5-6 cm. long; leaves oblanceolate, acuminate or long attenuate, 6-15 cm. long and 1.5-3 cm. broad, sparsely villous with multicellular hairs; inflorescence a unilateral spike with several flowers, peduncle slender, to 5 cm. long; calyx lobes 4, lance-triangular, acute, about as long as the hypanthium; corolla about 4 mm. long, yellow, glabrous or sparsely pilose, the lobes lance-oblong, acuminate, about as long as the tube; capsule about 3 mm. long, broadly turbinate.

PITTONIOTIS Grisebach

Small unarmed trees, the branches terete or obtusely angulate; leaves membranaceous, petiolate; stipules intrapetiolar, acuminate, persistent; inflorescence of paniculate cymes, the flowers secund along scorpioid branches, ebracteolate; flowers small, sessile; hypanthium oblong, the calyx 4-5-lobate, persistent; corolla salverform, pubescent outside, the tube cylindric, pilose in the throat, the limb 5-lobate, the lobes imbricate, 2 exterior; stamens 5, inserted in the corolla throat; anthers dorsifixed near the base, exserted; stigma bilobate, exserted; fruits drupaceous, elliptic-oblong, flesh very thin, 2-3-celled; the seeds cylindric, elongated, osseous.

The genus, often referred to *Antirhea*, consists of the following species.

Pittoniotis trichantha Griseb. Bonplandia 6: 8. 1858. *Antirrhoea trichantha* Hemsl. Biol. Cent. Am. Bot. 2: 42. 1881. Figure 39.

Known from a single specimen in Guatemala, in humid tropical forest near Sayaxche, Peten, *Ortiz 142*. Panama; northern South America.

Small tree to 8 m. tall and the trunk 20 cm. in diameter; stipules narrowly triangular, 4-6 mm. long, acuminate, appressed pilose outside; leaves elliptic-oblong to broadly ovate, abruptly short acuminate, appressed pilose becoming glabrescent with age; inflorescence paniculate cymose, the sessile flowers secund along the branches; hypanthium and calyx about 1.5 mm. long, sericeous; calyx lobes narrowly triangular, about 0.5 mm. long; corolla sericeous outside, about 5 mm. long with the lobes and tube about equal in length; anthers linear-oblong, about 1.5 mm. long, exserted; fruit 5-6 mm. long, oblong, sparsely pilose.

The genus is to be expected in other countries between Panama and Guatemala.

POGONOPUS Klotzsch

Trees or shrubs; stipules interpetiolar, small, cuspidate, tardily deciduous; leaves opposite, petiolate, the blades mostly membranaceous; flowers showy, pedicellate, in small cymes, these disposed in lax terminal panicles; hypanthium turbinate; calyx short, 5-dentate, deciduous, one of the lobes expanded into a large petiolate foliaceous bright-colored blade; corolla tubular, villous in the throat, the short limb 5-lobate, the lobes valvate in bud; stamens 5, inserted in the corolla tube, the slender filaments glabrous; anthers versatile, linear-oblong, exserted; ovary 2-celled, the slender style with 2 linear or oblong, obtuse branches; ovules numerous, the placentae longitudinally adnate to the septum; capsule subligneous, areolate at the apex, 2-celled, loculicidally bivalvate, many-seeded; seeds horizontal, crowded.

A genus of two or three species in tropical America, only one of them reaching North America.

Pogonopus speciosus (Jacq.) Schum. in Mart. Fl. Bras. 6, pt. 6: 265. 1889. *Macrocnemum speciosum* Jacq. Hort. Schoenbr. 1: 19, t. 43. 1797. *P. exsertus* Oerst. Amér. Centr. 17. 1863. *Flor de pascua; quina*. Figure 2.

Dry or damp forest of the tierra caliente of both coasts, at 300 m. or less; often planted for ornament; Alta Verapaz (Senahú; Pancajché); Santa Rosa; Suchitepéquez; Escuintla; San Marcos. Mexico (Chiapas) to Panama; Colombia and Venezuela.

A shrub or small tree, about 6 m. high, the branches conspicuously lenticellate, the branchlets puberulent or hirtellous; stipules triangular, 3-5 mm. long, cuspidate; petioles 2 cm. long or less, the blades obovate to elliptic or ovate, 6-20 cm. long, 3-10 cm. broad, abruptly acuminate or attenuate, acute to long-attenuate at the base, glabrous or puberulent above, sparsely or densely puberulent beneath; cymes few-flowered, arranged in a broad leafy panicle, the bracts foliaceous or linear; pedicels stout, 1 cm. long or shorter; hypanthium 4-5 mm. long, puberulent or densely fulvous-sericeous; calyx about 1 mm. high, 4 of the lobes minute, cuspidate, the fifth expanded into a large blade, this rounded-ovate, 1-5 cm. long, 1-4 cm. broad, on a slender petiole 1-2.5 cm. long, rounded to acute at the apex, rounded and short-decurrent at the base, purplish or bright deep red, palmately 5-lobed; corolla 2.5-3 cm. long, purple or deep red, densely or sparsely puberulent or sericeous, the tube 3-5 mm. broad, the deltoid-ovate lobes 3-4 mm. long, acute, puberulent within; stamens short-exserted; capsule 5-7 mm. long, 5-6 mm. broad, coarsely lenticellate; seeds 0.5 mm. long, pale yellowish.

Called "chorcha de gallo" in El Salvador and "pascua cimarrón" in Mexico. A showy and handsome tree because of the abundance of large and brightly colored calyx lobes. It is employed in Guatemala as a domestic remedy for malaria.

PORTLANDIA P. Browne

Shrubs or trees, glabrous or pubescent, often resinous; stipules intrapetiole, connate with the petioles to form a sheath, usually persistent; leaves opposite or verticillate, petiolate or sessile, the blades coriaceous or herbaceous; flowers large, axillary or terminal, the pedicels often bracteate; hypanthium usually turbinate, the calyx lobes 4-5, short or elongate, persistent; corolla large, subcampanulate to funnel-form or tubular-funnel-form, the tube 5-angulate, glabrous in the throat, the limb 4-5-lobate, the lobes reduplicate-valvate or subimbricate; stamens 4-5, inserted at the base of the throat or at the base of the corolla tube, the filaments filiform, pubescent; anthers basifixed, linear, included or short-exserted; ovary 2-celled, the style filiform, the apex entire, bilobate or with 2 long branches; ovules numerous, crowded on swollen placentae longitudinally adnate to the septum; capsule thick-coriaceous, terete, costate, or angular, loculicidally bivalvate from the apex; seeds numerous, usually compressed, angulate, the testa usually granulate.

A genus of about 18 species, chiefly in the West Indies. No others are known from Central America.

Portlandia guatemalensis Standl. Journ. Wash. Acad. Sci. 18: 162. 1928. Figure 1.

Wet mixed forest, 750-1,500 m.; endemic; Alta Verapaz (type from Quebrada Seca, *Harry Johnson* 282); Huehuetenango (Max-bal).

A shrub or small tree, sometimes epiphytic, the branchlets glabrous; stipules 5-6 mm. long, broadly triangular, cuspidate, persistent; leaves opposite, the slender petioles 1-2 cm. long, the blades oblong-elliptic, broadest at or near the middle, 9-16 cm. long, 3.5-6 cm. broad, acuminate, acute and decurrent at the base, membranaceous, glabrous above, much paler beneath, domatiate and short-barbate in the axils of the nerves, the lateral nerves about 7 on each side; inflorescences axillary, long-pedunculate, about equaling the leaves, racemiform-paniculate, the flowers clustered at the end of the rachis and in pedunculate lateral clusters, the bracts leaflike, lanceolate or elliptic; pedicels 3-4 mm. long; hypanthium broadly turbinate, 2-2.5 mm. long, the calyx lobes 5, distinct, linear-subulate, 1 cm. long, green, glabrous; corolla white, funnelform, glabrous, 4.5 cm. long, the tube very short, 2.5 mm. broad at the base, the throat 2.5 cm. broad, the 5 lobes broadly ovate-triangular, obtuse, 1.5 cm. long; stamens included, the linear anthers 8 mm. long; capsules and seeds unknown.

No doubt this is a showy plant when in flower. It is somewhat questionable whether it is properly referable to *Portlandia*. Capsules are not known and might suggest other placing of the plant. The genera *Hintonia* and *Coutarea* are possibilities.

POSOQUERIA Aublet

Trees or shrubs, glabrous or pubescent, with terete branches; stipules large, intrapetiolar, deciduous; leaves opposite, usually large, petiolate, coriaceous; inflorescence a terminal corymb; flowers perfect, very large, white, the pedicels ebracteate; hypanthium obovoid; calyx short, 5-dentate, usually persistent; corolla tube greatly elongate and slender, the throat scarcely dilated, glabrous or villous, the limb gibbous in bud, 5-lobate, the lobes oblique, obtuse, contorted in bud; stamens 5, inserted in the corolla throat, the filaments glabrous or pilose, erect or curved; anthers basifixed, linear-oblong, acute, pilose, exserted, the connective produced and bifid at the base; ovary 1-2-celled, with filiform style, the stigma small, bifid, included; ovules very numerous, peltate, the placentae stipitate, bilamellate, parietal; fruit baccate, often very large, globose or ovoid, fleshy, 1-2-celled; seeds large, obtusely angulate, with membranaceous testa.

About 20 species in tropical America. The only other Central American species is *P. grandiflora* Standl. of Costa Rica. The genus is easy to recognize because of the very large, white flowers with corolla conspicuously curved in bud.

Posoqueria latifolia (Rudge) R. & S. Syst. Veg. 5: 227. 1819. *Solena latifolia* Rudge, Pl. Guian. 1: 26, t. 40 1806. *P. coriacea*

Mart. & Gal. Bull. Acad. Brux. 11, pt. 1: 240. 1844. *Chintorol* (Izabal). Figure 29.

Wet forest or thickets, often along streams, on the coast of both slopes, at or little above sea level, ascending in the Pacific slopes to 1,400 m.; probably in Petén; Alta Verapaz; Izabal; Suchitepéquez; Sololá; Quezaltenango; San Marcos; Huehuetenango. Southern Mexico; British Honduras to Panama; southward to Bolivia and Brazil.

A glabrous shrub or tree, sometimes 12 m. high with a trunk 25 cm. in diameter, the branches thick and stout; stipules oval or oblong, 8-15 mm. long, green, obtuse or acute; petioles stout, 8-12 mm. long, the blades mostly oval to oblong, 8-25 cm. long, 4-12 cm. broad, acute or abruptly short-acuminate, obtuse or rounded at the base, lustrous above; corymbs with few or many flowers, pedunculate, most of the flowers pedicellate, fragrant; calyx and hypanthium 4-5 mm. long, the calyx shallowly lobate, often ciliate, the lobes rounded; corolla tube 12-16 cm. long, 2-4 mm. thick, the lobes spreading or reflexed, oblong or narrowly oblong, 1.5-2.5 cm. long, obtuse; anthers 6 mm. long; fruit globose, yellow, 4-5 cm. in diameter or larger, umbonate; seeds irregularly angulate, about 1 cm. long, black or nearly so, dull.

Among the vernacular names recorded are "mountain guava," "snake-seed" (British Honduras); "cachito" (Honduras); "azucena"; "toronja" (Oaxaca); "fruta de mono"; "guayabo de mico" (Costa Rica). The tree is a showy and very handsome one when in flower. Some of the Guatemalan specimens, particularly those from the west, are conspicuous for their unusually large and broad leaves, thus resembling *P. grandiflora* of Costa Rica, but in that the branchlets and leaves are pubescent. It is quite possible that when flowers of this Guatemalan form are available, it will prove to be a distinct species.

PSYCHOTRIA Linnaeus

Shrubs or small trees, rarely perennial herbs, the branches terete or somewhat tetragonous; leaves chiefly opposite, membranaceous to coriaceous, usually petiolate; stipules intrapetiolar, persistent or deciduous, often connate to form a sheath; flowers small, perfect, usually white or yellowish, terminal or rarely axillary, small, bracteate or ebracteate, variously arranged, the branches of the inflorescence usually green or greenish, rarely brightly colored, the inflorescence not involucrate; hypanthium small, the calyx persistent or deciduous; corolla funnelform, tubular, or subcampanulate, the tube short or elongate, straight, the throat naked or barbate, the limb 5-lobate, the lobes valvate in bud; stamens 5, inserted in the throat or mouth of the corolla, the filaments short or somewhat elongate; anthers dorsifixed near the base, linear or oblong, obtuse, included or exserted; ovary almost always 2-celled, the style short or elongate, glabrous or pilose, the 2 short branches subulate or linear; ovules solitary in the cells, erect from the base of the cell; fruit drupaceous, small, juicy, sometimes didymous, smooth or costate, of 2 nutlets or separating into 2 cocci, 2-seeded; nutlets smooth or costate dorsally, the ventral face plane or sulcate.

The largest genus of Rubiaceae, with probably 1,000 or more species, widely distributed in tropical regions of both hemispheres. Many other species are known from southern Central America. In America the genus is best represented in South America, especially in equatorial Brazil and in the Andes.

Different authors have treated this tribe of Rubiaceae very differently. Mueller included in *Psychotria* such groups as *Palicourea*, *Cephaelis*, and *Geophila*. Bremekamp in treating the Rubiaceae of Surinam has segregated several small or large groups, but their segregation contributes little or nothing toward simplification of the highly complicated groups of species here taken to constitute the genus *Psychotria*.

The most recent account of American Psychotrias is that of Dr. Julian A. Steyermark (in Mem. N. Y. Bot. Gard. 23: 406-717. 1972) where an attempt is made to classify the neotropical Psychotrias into two subgenera, subg. *Psychotria* and subg. *Heteropsychotria*. Subgenus *Heteropsychotria* is further divided into some 13 sections. Steyermark's paper covers the Guayana highland region and all contiguous areas, perhaps the richest area of the world in Psychotrias. The paper is especially useful since he often included data on the entire range of species known from the Guayana highlands.

Dr. Steyermark has placed *Cephaelis*, which we have maintained, into *Psychotria*. *Cephaelis*, at least in our region, seems to be a useful generic unit.

We are pleased to acknowledge the assistance of our colleague Dr. Donald R. Simpson in this difficult genus.

Inflorescence axillary.

Flowers densely clustered in the leaf axils, the inflorescence equaling or shorter than the petioles; leaves elliptic.....*P. erecta*.

Flowers in long-pedunculate panicles, the inflorescences usually much longer than the petioles; leaves oblanceolate-linear to oblong or oblanceolate.

Leaves oblanceolate-linear, 2.5 cm. broad or less, on short petioles 1 cm. long or shorter.....*P. pleuropoda*.

Leaves mostly oblanceolate to oblong and 3-10 cm. broad or broader, long petiolate.

Fruit white; leaves thin and membranaceous, green beneath.....*P. macrophylla*.

Fruit red; leaves succulent, very pale beneath.....*P. uliginosa*.

Inflorescences mostly terminal or at least pseudoterminal.

Stipules caducous, entire or nearly so, brown or ferruginous, thin; plants generally turning blackish or grayish when dried. Subgenus *Psychotria*.

Calyx deeply lobate, the lobes lance-linear.....*P. horizontalis*.

Calyx shallowly dentate with broad teeth, or truncate.

Young branches densely pilose or villosulous with long or short, spreading hairs.

Leaves glabrous beneath or merely puberulent along the costa, small, 2-5 cm. long.....*P. parviflora*.

Leaves hirsute or densely short pilose beneath, usually over most of the surface, mostly 5-12 cm. long or larger.

Leaves mostly 6-10 cm. broad, pubescent.....*P. nervosa* var. *rufescens*.

Leaves 2-5 cm. broad.

Leaves acuminate or long acuminate, mostly 3-5 cm. broad, glabrous.

P. nervosa.

Leaves obtuse or subacute, mostly 2-3 cm. broad.....*P. erythrocarpa*.

Young branches glabrous or nearly so, sometimes minutely puberulent.

Flowers glomerate, the glomerules spicate, the spikes paniculate; leaf blades long attenuate at the base, on very short petioles.....*P. viridis*.

Flowers glomerulate or in cymes, but never in spicate glomerules.

Panicles all or mostly sessile, often or usually becoming pseudoaxillary by the elongation of the branch above the insertion of the panicle.

Stipules shallowly or deeply bilobate at the apex.....*P. tenuifolia*.

Stipules entire.

Lateral nerves of the leaves about 9 pairs; blades broadest above the middle, conspicuously coriaceous.....*P. oerstediana*.

Lateral nerves of the leaves 12-20 pairs; blades mostly broadest at or below the middle, herbaceous or subcoriaceous.

Stipules 1.5 cm. long or shorter; leaves 3-7.5 cm. broad.

Fruit conspicuously longer than broad, oblong or ellipsoid.

P. nervosa.

Fruit globose.

Leaves mostly 2-3.5 cm. broad, thin, sparsely barbate beneath in the nerve axils.....*P. agularii*.

Leaves mostly 5.5-7.5 cm. wide, subcoriaceous, not barbate beneath.....*P. schippii*.

Stipules 2-4 cm. long or larger; leaves 5-15 cm. broad or even larger.

Calyx about 2 mm. broad; leaves usually subcordate to obtuse at the base, often abruptly contracted and decurrent, rarely acute.....*P. limonensis*.

Calyx about 1 mm. broad; leaves acute or acuminate at the base.

P. yunckeri.

Panicles on long or short peduncles, rarely or never becoming axillary by elongation of the branch.

Stipules rounded or very obtuse at the apex, entire; flowers all sessile or nearly so.

Leaves sparsely barbate beneath in the nerve axils; panicles usually with only 3 basal branches.....*P. lundellii*.

Leaves not barbate beneath; panicles usually with more than 3 verticillate basal branches.....*P. carthaginensis*.

Stipules acute, acuminate, or attenuate, sometimes bilobate at the apex.

Lateral nerves of the leaves usually 6-8 pairs; leaves small, mostly 2-3 cm. broad.

Flowers mostly slender pedicellate, leaves membranaceous.

P. graciliflora.

Flowers sessile or on short stout pedicels; leaves subcoriaceous.

P. fruticetorum.

Lateral nerves of the leaves mostly 10-15 pairs.

Flowers pedicellate.

Pedicels slender, about 2-5 mm. long; lowland species.

P. marginata.

Pedicels thicker, about 2 mm. long; montane species ...*P. yunckeri*.

Flowers all sessile or nearly so.

Branches of the panicles finely puberulent*P. clivorum*.

Branches of the panicles glabrous or hirsutulous.

Leaves mostly 2-3.5 cm. broad; branches of the panicles glabrous.....*P. altorum*.

Leaves mostly 4-7 cm. broad; branches of the panicles hirtellous or almost glabrous.....*P. flava*.

Stipules long persistent, usually green or greenish, variable in form, most often deeply bilobate or connate into a truncate sheath which is produced into short or elongate lobes, sometimes entire. Subgenus *Heteropsychotria*.

Plants epiphytic; leaves thick and fleshy, coriaceous when dry, the lateral nerves obscure.....*P. parasitica*.

Plants terrestrial; leaves not fleshy, the lateral nerves usually conspicuous.

Young branches densely pilose or villous with longer or short, chiefly spreading hairs.

Bracts of the inflorescence large and conspicuous, at least equaling the calyx, sometimes much longer.

Leaves glabrous on the upper surface, 2-3 cm. broad.....*P. steyermarkii*.

Leaves hirsute or villous on the upper surface, mostly 4-10 cm. broad.

Inflorescence head-like or of few cymose heads; leaves densely soft pilose or villous beneath.....*P. purpusii*.

Inflorescence paniculate-cymose; leaves thinly pilose or hirsute below.

Bracts in the cymules ovate or lanceolate-ovate.....*P. calopogon*.

Bracts in the cymules linear.....*P. chrysocalymma*.

Bracts of the inflorescence small and inconspicuous, often minute, shorter than the calyx.

Corolla 13-14 mm. long, very densely villous with long spreading hairs.

P. heydei.

Corolla much smaller, villous with short hairs or glabrous.

Inflorescence recurved, at least in age; leaves glabrous or essentially so on the upper surface.

Fruits and inflorescences spreading pilose pubescent with whitish hairs*P. pittieri*.

Fruits and inflorescences puberulent or with short sordid spreading hairs.....*P. dispersa*.

Inflorescence erect; leaves evidently pubescent on the upper surface.

Corolla about 1 cm. long; inflorescence corymbiform*P. skutchii*.

Corolla much less than cm. long; inflorescence thyrsoid-paniculate.

Lateral nerves of the leaves about 20 pairs; leaf blades narrowly lance-oblong or oblong-oblancheolate*P. pachecoana*.

Lateral nerves of the leaves about 13-16 pairs; leaf blades mostly elliptic to elliptic-oblancheolate.....*P. orogenes*.

Young branches glabrous or merely puberulent.

- Bracts of the inflorescence large and conspicuous, longer than the calyx; inflorescence sometimes capitate, the heads solitary or paniculate.
- Corolla 3-4 cm. long.....*P. chiapensis*.
- Corolla less than 1 cm. long.
- Branches of the inflorescence glabrous*P. capitata*.
- Branches of the inflorescence hirtellous.
- Primary branches of the inflorescence bracteate at the base.
- Stipules bifid at the center, lobes not lateral.....*P. brachiata*.
- Stipules truncate with elongated linear lateral lobes...*P. izabalensis*.
- Primary branches of the inflorescence not bracteate at the base.
- P. officinalis*.
- Bracts of the inflorescence small and inconspicuous, shorter than the calyx; inflorescence never capitate.
- Stipules large, often 2 cm. long, not bilobate*P. grandis*.
- Stipules less, usually much less than 1 cm. long, usually bilobate.
- Calyx truncate.
- Stipule lobes caducous, membranaceous; calyx 1 mm. long or more; leaves acute to very obtuse and abruptly short pointed.
- P. microdon*.
- Stipules lobes persistent, stiff, subulate; calyx scarcely 0.5 mm. long; leaves cuspidate-acuminate.....*P. cuspidata*.
- Calyx evidently dentate.
- Calyx tubular below, much exceeding the hypanthium; corolla 12-15 mm. long.....*P. mombachensis*.
- Calyx cleft or dentate almost or quite to the base, usually shorter than the hypanthium, rarely longer; corolla 8 mm. long or usually much shorter.
- Inflorescence thyriform, the lower and middle branches often reflexed.
- Lobes of the stipules short, ovate; leaves usually more or less pubescent beneath; branches of the inflorescence green.
- P. berteriana*.
- Lobes of the stipules elongate, subulate; leaves glabrous; branches of the inflorescence reddish or purplish.
- Leaves long attenuate at the base, with more than 10 pairs of lateral nerves; petioles more than 1 cm. long; species of the Pacific slopes*P. oreodoxa*.
- Leaves abruptly contracted at the base, not attenuate, with fewer than 10 pairs of lateral nerves; petioles less than 1 cm. long; species of the Atlantic lowlands.....*P. patens*.
- Inflorescence corymbiform or paniculate but not thyriform, the branches spreading or ascending.
- Leaves mostly 7-15 cm. long; inflorescences rather large and many-flowered.
- Branches of the inflorescence glabrous or essentially so.
- P. simiarum*.
- Branches of the inflorescence densely puberulent or hirtellous.
- P. pubescens*.
- Leaves mostly 2-6 cm. long; inflorescences small and with very few flowers.

Calyx lobes much longer than the hypanthium*P. lilacina*.

Calyx lobes shorter than the hypanthium.....*P. minarum*.

***Psychotria aguilarii* Standl. & Steyerl. Field Mus. Bot. 23: 23. 1943. *Pihitziquín* (Aguilar).**

Damp thickets or forest, at about 1,500 m.; endemic; Guatemala; Chimaltenango (type collected between Chimaltenango and San Martín Jilotepeque, *Standley 80900*).

A shrub 1-1.5 m. high, the branches glabrous; stipules caducous, about 1 cm. long, membranaceous, ferruginous, glabrous, at first enclosing the terminal buds but soon cleft on each side; leaves short-petiolate, membranaceous, on petioles 5-12 mm. long, oblanceolate or oblong-oblanceolate, 8-12 cm. long, 2-3.5 cm. broad, narrowly attenuate-acuminate, narrowly long-attenuate to the base and long-decurrent, green and glabrous above, paler beneath, glabrous but domatiate in the nerve axils and sparsely short-barbate, the lateral nerves about 11 on each side; inflorescence terminal, sessile, lax and few-flowered, as much as 4.5 cm. long, few-rayed at the base, the branches glabrous, the small bracts caducous, the flowers sessile or nearly so, aggregate at the ends of the branches; calyx and hypanthium about 1 mm. long, glabrous, the calyx truncate and remotely dentate, slightly shorter than the hypanthium; corolla white, glabrous outside, 5 mm. long, not barbate in the throat, the lobes 1.5 mm. long, obtuse, glabrous within; fruit deep red, globose, 6 mm. in diameter, the nutlets coarsely granulate dorsally, ecostate.

***Psychotria alorum* Standl. & Steyerl. Field Mus. Bot. 23: 86. 1944. *Huesito blanco*.**

Wet mixed mountain forest and thickets, 300-2,700 m.; Chimaltenango; Sololá; Suchitepéquez; Quezaltenango (type from Montaña Chicharro, southeastern slopes of Volcán de Santa María, 2-4 miles south of Santa María de Jesús, *Steyermark 34302*); San Marcos. Mexico (Chiapas); El Salvador.

A shrub 1.5-3.5 m. tall or even larger, the slender branches glabrous; stipules caducous, distinct, about 12 mm. long, ferruginous, ovate or oblong-ovate, acuminate or sometimes shallowly bilobate at the apex; leaves short-petiolate, herbaceous, on petioles 5-10 mm. long, oblong-oblanceolate or narrowly oblanceolate, 9-12 cm. long, 2-3.5 cm. broad, acute or obtuse, narrowly long-attenuate to the base, glabrous, the lateral nerves about 10 on each side, the nerve axils not barbate or domatiate; inflorescence terminal, ovoid-paniculate, many-flowered, erect on a peduncle 1.5-5 cm. long, as much as 5.5 cm. long and 5 cm. broad, the basal branches about 4, divergent or reflexed, glabrous, the bracts caducous, the flowers densely aggregate in small cymes or umbels, sessile or short-pedicellate; calyx and hypanthium 2 mm. long, the calyx campanulate, slightly longer than the thick hypanthium, remotely dentate or subentire; corolla white, about 5 mm. long, glabrous outside, not barbate in the throat, the lobes oblong, obtuse, recurved, a little more than half as long as the tube, glabrous within; style short-exserted; apices of the anthers exserted; fruit pale orange or red, subglobose, 6 mm. long, the nutlets coarsely costate dorsally.

Psychotria berteriana DC. Prodr. 4: 515. 1830. *P. platyphylla* DC. l.c. 517. *P. crebrinervia* Standl. Field Mus. Bot. 4: 343. 1929 (type from the Atlantic coast of Honduras).

Dense wet mixed forest or thickets, sometimes in pine forest, ranging from sea level to about 1,500 m.; Petén; Alta Verapaz; Baja Verapaz; Izabal; Huehuetenango. Southern Mexico; British Honduras to Panama and Colombia; West Indies.

Usually a shrub of 2-4.5 m., sometimes a tree of 6 m., the slender brittle branches glabrous or puberulent, sometimes hirtellous when young; stipules persistent, thin, about 4 mm. long, bilobate, the short lobes ovate, acute; leaves large and thin, on petioles 1.5 cm. long, lance-oblong to oblong-ovate, mostly 15-18 cm. long and 5-6.5 cm. broad, often smaller, long-acuminate, rounded to acute at the base and usually abruptly short-decurrent, almost glabrous above but usually rough to the touch, sparsely villosulous beneath or almost glabrous; panicles terminal, mostly long-pedunculate, often recurving in age, generally thyrsoform but often pyramidal, usually large, lax, and open, as much as 16 cm. long and broad, the branches densely short-pilose, the flowers mostly short-pedicellate; bractlets small but relatively broad, green, rather conspicuous; calyx minute and remotely dentate; corolla greenish yellow, minutely pilose or almost glabrous, 10 mm. long or less; fruit black at maturity, subglobose, 4-5 mm. in diameter, round cystoliths present.

The species as we have treated it here is quite variable one and may include more than one species. In Guatemala the species is found only on the Atlantic side but the elevations and the ecological situations in which it occurs are rather too diverse. Specimens from the Pacific highlands put here by the senior author have been segregated by the junior author as *Psychotria standleyana*.

Psychotria brachiata Swartz, Prodr. Veg. Ind. Occ. 45. 1788.

Moist or wet, mixed, lowland forest, 800 m. or less; Izabal; Alta Verapaz (region of Cubilgüitz); Huehuetenango. British Honduras, and doubtless also in Petén at or little above sea level. Southern Mexico to Panama, southward to Peru; West Indies.

A shrub 4 m. high or less, the branches green, usually glabrous; stipules persistent, 5-8 mm. long, bilobate, the lobes obtuse or rounded; leaves on petioles 2 cm. long or less, oblong-obovate to oblong-elliptic, 10-15 cm. long, 6 cm. broad or less, short-acuminate, acute to attenuate at the base, glabrous or nearly so, often pilose beneath along the costa, the lateral nerves about 10 pairs, strongly curved; inflorescence terminal, erect, long-pedunculate, thyrsoid-paniculate or racemiform, rarely somewhat pyramidal, the branches opposite, subdivaricate, subtended at the base by long narrow green bracts, the flowers sessile in small dense bracteate heads; calyx remotely denticulate; corolla 6-8 mm. long, white or ochroleucous, villous in the throat, the oblong lobes shorter than the tube; fruit blue at maturity, about 5 mm. long, crowned by the persistent calyx, the nutlets costate dorsally.

Psychotria calopogon L. Wms., *Phytologia* 28: 227. 1974.

Dense, rich lowland forests, 150-300 m.; endemic; Alta Verapaz; Huehuetenango (type, *Steysmark* 49308).

Shrubs to 2.5 m. tall, the stems spreading pilose pubescent, probably glabrescent with age, stipules lanceolate, bilobate, the apices scarious. Leaves elliptic to broadly elliptic, acuminate, with about 20 pairs of secondary nerves these prominent below, pilose on both surfaces, more so below and along the mid-vein, pale green above and lighter below, the blade 12-30 cm. long and 3.5-12 cm. broad, the petioles 1-3 cm. long, spreading pilose pubescent; inflorescence terminal, pedunculate, a rather loose, many-flowered panicle with the lateral branches of capitulate, bracteate cymules; cymules subtended by 3-5 lanceolate, acute or acuminate, pilose bracts mostly 4-5 mm. long and 1.2-2 mm. broad; hypanthium and calyx about 2 mm. long, densely pilose, the calyx lobes narrowly lanceolate, acute, about 0.7-0.8 mm. long; corolla white, mostly 4-5 mm. long, the tube narrowly cylindric and about 3.5 mm. long, the lobes ovate, acute, pilose dorsally, 1-1.5 mm. long; style about as long as the tube, stigma bipartite; stamens attached in throat of the corolla and the anthers exerted and about 0.5 mm. long; fruit not known.

This species belongs in a complex surrounding *P. pilosa* R. & P. of South America. Three or four related species are known from Central America and Mexico.

Psychotria capitata Ruiz & Pavón, *Fl. Peruv.* 2: 59, *t.* 206, *f.* a. 1799. *P. inundata* Benth. in *Hook. Journ. Bot.* 3: 229. 1841. *Palicourea stevensonii* Standl. *Trop. Woods* 16: 42. 1928 (type from Middlesex, British Honduras, *Neil S. Stevenson*).

Collected at various localities in British Honduras, and to be expected in Izabal and Petén. Honduras; Nicaragua; Panama, and southward to Bolivia and Brazil.

A glabrous shrub 1-3 m. high; stipules persistent, green, biparted, with long subulate lobes, the stipules near the ends of the branches with much longer, lanceolate lobes; leaves subcoriaceous, on short stout petioles, lanceolate to oblong-elliptic or oval, mostly 11-16 cm. long and 5-6 cm. broad, acuminate or abruptly short-acuminate, acute or obtuse at the base, the lateral nerves about 18 pairs, prominent and pale beneath; inflorescence terminal, thyrsoid-paniculate, erect, rather dense, the branches pubescent, opposite or verticillate, the primary ones without bracts at the base, the flowers sessile or nearly so, the bracts subtending them lanceolate or linear, pale green or whitish, conspicuous, about equaling the flowers; calyx teeth minute, unequal; corolla white or ochroleucous, glabrous, 8-9 mm. long, the lobes almost equaling the tube; fruit subglobose, 4 mm. long, coarsely costate, black.

Psychotria carthaginensis Jacq. *Enum. Pl. Carib.* 16. 1760. *P. foveolata* Ruiz & Pavón, *Fl. Peruv.* 2: 59, *t.* 207, *f.* b. 1799.

Moist or dry forest or thickets, chiefly on the Pacific coastal plain, at 400 m. or less; Zacapa; Escuintla; Suchitepéquez; San Marcos; probably along the whole Pacific coast. Southern Mexico to Panama, southward to Bolivia and Argentina.

A shrub 1-2 m. high, glabrous or nearly so; stipules membranaceous, ferruginous, caducous, less than 1 cm. long, obtuse or rounded at the apex; leaves short-petiolate, commonly rather thick, lance-elliptic to oblong-obovate, broadest at or above the middle, commonly 6-12 cm. long and 3-5 cm. broad, acute or acuminate or sometimes obtuse, at the base acute to long-attenuate, glabrous beneath or rarely puberulent on the nerves, often conspicuously domatiate in the nerve axils, the lateral nerves about 10 pairs; inflorescence terminal, erect, paniculate, usually long-pedunculate, generally radiately branched from the base, with divergent branches, the branches glabrous, the bracts caducous, the flowers sessile or nearly so; calyx obsoletely denticulate; corolla white, glabrous or very minutely puberulent, 4-5 mm. long, with very short lobes; fruit red, subglobose, 4 mm. long, the nutlets costate dorsally.

It is not altogether certain that the plants of Guatemala are identical with those of Cartagena, Colombia. Neither is it certain that only one species is involved in the Central American material. The subgenus *Psychotria* is badly in need of revision. Half of the species of *Psychotria* in Guatemala belong to this subgenus and most of them present problems.

Psychotria chiapensis Standl. Contr. U. S. Nat. Herb. 23: 1390. 1926. *Cephaelis tetragona* Donn.-Sm. Bot. Gaz. 61: 376. 1916, not *Psychotria tetragona* Seem. 1865-67 (type from Tuis, Costa Rica). *Palo de agua*. Figure 47.

Wet forest or thickets, widely distributed, at 1,400 m. or lower; Petén; Alta Verapaz; Izabal; Escuintla; Guatemala; Sololá; Suchitepéquez; Retalhuleu; Quezaltenango; San Marcos; Huehuetenango. Southern Mexico and British Honduras to Panama; type from Chiapas.

A shrub or small tree, commonly 2-6 m. high, the branches glabrous or obscurely villosulous; stipules small, persistent, bilobate, with broad obtuse lobes; leaves short-petiolate, elliptic-oblong to oblong-oblongeolate, commonly 12-20 cm. long and 5-10 cm. broad, short-acuminate, acute or acuminate at the base, glabrous, the lateral nerves about 12 pairs; inflorescence terminal, erect, pedunculate, the flowers subcapitate, in large dense heads, these corymbose or cymose, the large broad green bracts rounded at the apex; calyx 5-6 mm. long, puberulent, denticulate; corolla white, almost glabrous, the slender tube as much as 3 cm. long, the narrow lobes 8 mm. long; fruit oval-globose, 1-1.5 cm. long, about 1 cm. broad, the 2 nutlets acutely carinate dorsally, plane and not sulcate on the inner face.

Called "cassada" and "white wood" in British Honduras; "yaxcanan" (British Honduras, Maya). The plant does not fall

satisfactorily in the genus *Psychotria*, and could be placed almost equally well in *Cephaelis*. The corolla is much larger than in any other Central American species of *Psychotria*.

Psychotria chrysocalymma L. Wms. *Phytologia* 28: 228. 1974.

Probably in the montane forest above 2,400 m.; El Progreso (type from Volcán Sta. Luisa, *Steyermark* 43518). Endemic.

Shrubs to 2 m. tall or perhaps more, the branches densely and softly short pilose pubescent; stipules persistent, with two lateral lanceiform lobes 2-3 mm. long. Leaves short petiolate, elliptic, acuminate, pilose-pubescent or sparsely hirsute on both surfaces, 12-15 cm. long and 4-5.5 cm. broad when mature, secondary nerves 11-13 pairs, petiole slender, 1-2 cm. long; inflorescences lateral, long pedunculate subumbelliform cymes covered with yellowish or golden multicellular pubescence, the peduncle about 6 cm. long, the cymes about 4 cm. long, the bracts subtending each division of the inflorescence linear and acute 10, to 3 mm. long; flowers in each cymule about 4-5, short pedicellate, subtended by bracts longer than the calyx; hypanthium and calyx about 4 mm. long, densely short pilose, calyx lobes narrowly lanceolate, acute, 1.5-2 mm. long; corolla white, tubular, widest above the middle, pubescent outside especially above, 13-15 mm. long, the lobes short, oblong-lanceolate, about 2 mm. long; style as long as the corolla, apex shortly bilobate; stamens inserted in the throat of the corolla, included, anthers about 3 mm. long; fruits narrowly ovoid, each carpel prominently 3-ribbed dorsally, sparsely to densely pubescent, 5-6 mm. long.

Closely related to *P. purpusii* Standl. which is known from the slopes of Volcán Tacumulco and in adjacent Chiapas.

Psychotria clivorum Standl. & Steyer. *Field Mus. Bot.* 23: 87. 1944.

Wet mixed forest, 600-1,400 m., in the western highlands; Suchitepéquez (type from Finca Mocá, *Skutch* 2073); Quezaltenango (below Santa María de Jesús); San Marcos. Doubtless also in Chiapas.

A shrub 1.5-4.5 m. high, the branches glabrous; stipules caducous, 1.5 cm. long or less, oval or broadly ovate, membranaceous, ferruginous, glabrous, obtuse or rounded at the apex and abruptly short-acuminate, the apex shallowly bilobate; leaves large, short-petiolate, herbaceous, on petioles 1-2.5 cm. long, oblong-ob lanceolate or narrowly oblanceolate, 13-30 cm. long, 4.5-5 cm. broad, acuminate or long-acuminate, gradually long-attenuate to the base, glabrous, the lateral nerves about 20 pairs; inflorescence terminal, erect, on a peduncle about 5 cm. long, paniculate, many-flowered, dense or rather lax, 4-7.5 cm. long and as much as 7 cm. broad, the basal branches verticillate, densely and minutely puberulent, often reflexed, the small bracts caducous, the flowers aggregate in small cymes, sessile or nearly so; calyx and hypanthium 1-1.5 mm. long, minutely puberulent or glabrate, the calyx limb 1.5 mm.

broad, remotely and shallowly dentate or subtruncate, the teeth broadly triangular; corolla white, glabrous outside, scarcely 4 mm. long, the lobes reflexed, oblong-ovate, obtuse, glabrous within, about half as long as the tube, the throat not barbate; fruit red, oval-globose, 5-6 mm. long, the nutlets coarsely costate dorsally.

***Psychotria cuspidata* Bredem. ex R. & S. Syst. Veg. 5: 192. 1819.**

Wet mixed forest, 200 m. or less; Izabal; Petén; Huehuetenango. Southern Mexico and British Honduras to Panama, southward to Peru and Brazil; West Indies.

A slender glabrous shrub, usually 1.5-2.5 m. high; stipules green, persistent, very short, bicuspidate, usually appressed; leaves thin but rather stiff, short-petiolate, bright green or yellowish green when dried, ovate to elliptic or oblong-elliptic, commonly 11-16 cm. long and 6-8 cm. broad, cuspidate-acuminate, usually with a somewhat curved acumination, acute to obtuse at the base, the lateral nerves about 14 pairs; inflorescence terminal, small, pedunculate, thyrsoid-paniculate or sometimes corymbiform, much shorter than the leaves, rather few-flowered, commonly 1.5-3 cm. broad, the few pale or reddish branches minutely puberulent or glabrous, not bracteate at the base, the flowers partly sessile and partly on short stout pedicels; calyx minute, truncate; corolla white or cream, glabrous or minutely puberulent, 5 mm. long or less; stamens exserted; fruit didymous-globose, smooth, black at maturity.

A common shrub in forests of the Atlantic coast of Central America.

***Psychotria dispersa* Standl. Journ. Wash. Acad. Sci. 18: 184. 1928.**

Wet thickets and moist forest of the Pacific plains and slopes, 550-750 m.; Escuintla (between Río Jute and Río Pantaleón); Suchitepéquez (Pueblo Nuevo); to be expected in Petén and Izabal since the species has been collected in British Honduras. Ranging southward to Panama, the type collected near Tilarán, Guanacaste, Costa Rica.

A slender shrub 1-2 m. tall, the branches green, short-pilose with spreading hairs; stipule sheath 2.5-3 mm. long, persistent, the lobes linear, 3-6 mm. long; leaves small, short-petiolate, oblong-elliptic to lance-oblong, 6-10 cm. long, 2-4 cm. broad, thin, abruptly acuminate, at the base acute and often decurrent, glabrous above, paler beneath, pilose on the nerves with short spreading hairs, the lateral nerves about 12 pairs; inflorescence terminal, paniculate, usually reflexed in fruit, pedunculate, paniculate, 2-4 cm. long and broad, rather lax and open, the branches hirtellous, the branches all subtended by long narrow green bracts, the flowers sessile or subsessile; calyx less than 1 mm. long, the teeth triangular; corolla white, puberulent, 3-3.5 mm. long; fruit blue, puberulent or glabrate, 3 mm. long, the nutlets costate dorsally.

Psychotria erecta (Aubl.) Standl. & Steyererm. Field Mus. Bot. 23: 24. 1943. *Ronabea latifolia* Aubl. Pl. Guian. 134, t. 59. 1775, not *Psychotria latifolia* Humb. & Bonpl. 1819. *R. erecta* Aubl. op. cit. 156. 1775. *P. axillaris* Willd. Sp. Pl. 1: 962. 1798. *Appunia parviflora* Lundell, Contr. Univ. Mich. Herb. 4: 28. 1940 (type from Silk Grass Creek Reserve, British Honduras, *Gentle* 2986).

Wet, mixed lowland forest or thickets, 180 m. or lower; probably in Petén; Alta Verapaz; Izabal. British Honduras; Nicaragua; Costa Rica; Colombia and the Guianas to Brazil and Bolivia.

A sparsely branched shrub, usually 1-2 m. high, rarely a tree of 7 m. (?), glabrous or nearly so; stipules persistent, subulate from a short broad base; leaves often blackening in drying, subcoriaceous, on petioles 1.5 cm. long or less, oval to oblong-elliptic or obovate, mostly 12-15 cm. long and 6-7 cm. broad, abruptly short-acuminate, acute at the base, with about 9 pairs of lateral nerves, glabrous above, very sparsely short-pilose beneath or almost glabrous; inflorescences all axillary, few-flowered and headlike, equaling or shorter than the petioles, the short peduncle densely pubescent; hypanthium glabrous, 1.3 mm. long; calyx cupular, 1.3 mm. long, truncate or remotely denticulate; corolla white, glabrous outside, 6 mm. long, the lobes shorter than the tube; fruit black, ovoid, 8 mm. long, glabrous; pyrenes sulcate on the inner surface.

Psychotria erythrocarpa Schlecht. Linnaea 9: 595. 1834. *Cereza silvestre*; *pakexté* (Huehuetenango); *chichipin* (fide Aguilar); *caquechpox* (Huehuetenango, fide Seler).

Moist thickets or dry rocky slopes, 500-1,800 m.; El Progreso; Zacapa; Chiquimula; Jalapa; Jutiapa; Guatemala (Estancia Grande); Quiché; Huehuetenango. Southern Mexico; Honduras.

A densely branched shrub 1-3 m. high, the branches very leafy, densely pilose with spreading hairs; stipules 2 cm. long or less, caducous, at first enclosing the terminal buds, ferruginous, pilose, cleft along one side as the leaves unfold; leaves herbaceous, short-petiolate, mostly oblanceolate-oblong, sometimes obovate, 3.5-10 cm. long, 1.5-3.5 cm. broad, obtuse or acute, sparsely or densely short-pilose above, usually very densely and softly pilose beneath with slender pale hairs, the lateral nerves about 10 pairs, conspicuous beneath; inflorescence terminal, on a long or short peduncle, cymose-corymbose or paniculate, usually small and rather lax, the flowers sessile or short-pedicellate, the branches densely short-pilose; calyx and hypanthium densely short-pilose, the calyx subtruncate; corolla small, white, puberulent or hirtellous, the lobes shorter than the tube, the throat not barbate; fruit subglobose, 4-5 mm. long, red or deep red, pilose, the nutlets coarsely costate dorsally.

Psychotria flava Oerst. ex Standl. Journ. Wash. Acad. Sci. 17: 341. 1927.

Wet thickets or mixed forest, widely distributed in Guatemala at 1,500 m. or less; Petén; Izabal; Alta Verapaz; Zacapa; Chiquimula (record doubtful); Suchitepéquez (Finca Mocá); Sololá. Southern Mexico and British Honduras.

A shrub or small tree, reported to attain a height of 7 m., but usually lower, the young branches stout, glabrous; stipules caducous, thin, ovate-triangular or broadly ovate, 1.5 cm. long or less, narrowed to the apex and shallowly bilobate, the apical lobes acute or acuminate, ferruginous-puberulent on the outer surface or sometimes glabrous; leaves large, rather thick and often coriaceous, usually yellowish when dried, on petioles 1-3 cm. long, narrowly oblanceolate-oblong to obovate-oblong, rarely linear-oblanceolate, 10-30 cm. long, 2.5-13 cm. broad, obtuse to short-acuminate, cuneate-attenuate or long-attenuate at the base, beneath minutely hirtellous on the nerves and puberulent between them or often glabrous, the nerve axils not domatiate or barbate, the lateral nerves about 20 on each side, or often fewer; inflorescence terminal, erect, on stout peduncles 10 cm. long or less, cymose-paniculate, the branches hirtellous or glabrate, the lower ones verticillate and often reflexed, the flowers sessile; hypanthium and calyx usually densely and minutely puberulent, the calyx scarcely 1 mm. long, truncate or obscurely repand-dentate, 1.5 mm. broad; corolla white or cream, 4.5 mm. long, glabrous outside, the lobes ovate, obtuse, shorter than the tube; anthers usually exserted; fruit red, subglobose or obovoid, 8-15 mm. long, glabrous, the nutlets plane on the inner face, coarsely costate dorsally.

From Oaxaca, Mexico there are reported the local names "tepecajete blanco," "marita," and "hoja lisa." The sapwood is described as pale yellow, the heartwood as dark chocolate-brown.

***Psychotria fruticetorum* Standl.** Journ. Arnold Arb. 11: 42. 1930. *Rax-ac* (Alta Verapaz, Quecchi).

Usually in wet thickets or forest, sometimes in open places, ranging from sea level to about 1,600 m.; Petén; Izabal; Alta Verapaz; El Progreso; Chiquimula; Chimaltenango. Mexico (Campeche and Tabasco) to British Honduras and Honduras, the type from Siguatepeque, Honduras.

A branched shrub 1-3 m. tall, the branches glabrous; stipules caducous, ovate or lanceolate, ferruginous, mostly 3.5-5 mm. long, acuminate; leaves small, often blackening when dried, short-petiolate, obovate-oblong to oblong-oblanceolate, mostly 5-7 cm. long and 2-2.5 cm. broad, obtuse to acuminate, cuneate-attenuate to the base, usually quite glabrous, commonly domatiate beneath in the nerve axils but not barbate, the lateral nerves about 8 pairs; inflorescences terminal, erect, cymose-corymbose, on short or elongate peduncles, rather few-flowered, dense in anthesis but in fruit open, mostly 2-2.5 cm. broad, the bracts minute, deciduous, the flowers mostly sessile; calyx minute, 0.5 mm. long, the lobes ovate, acute; corolla white or greenish white, 3 mm. long, glabrous outside, not barbate in the throat, the lobes about equaling the tube; anthers usually exserted; fruit red, subglobose, 3-4 mm. long, the nutlets coarsely costate dorsally, the inner face plane.

Some of the earlier Guatemalan collections were determined as *Psychotria alba* Ruiz & Pavón, a species not definitely known to occur in northern Central America.

Psychotria graciliflora Benth. ex Oerst. Vid. Medd. Kjöbenhavn 1852: 35. 1852.

Moist or wet, mixed forest, 1,500 m. or less; Petén; Izabal; Huehuetenango. Ranging southward to Panama.

A rather dense, much branched, leafy shrub 1-2 m. high, glabrous almost throughout; stipules caducous, small, thin, ferruginous, acuminate, entire or bidentate at the apex; leaves small, blackening when dried, membranaceous, elliptic-oblong or lance-oblong, 8 cm. long and 3 cm. broad or usually smaller, acuminate, attenuate to the base, the lateral nerves about 7 on each side, often domatiate in the nerve axils but not barbate; inflorescences terminal, slender-pedunculate, erect, small and mostly few-flowered, in fruit lax and open, trichotomous at the base, the flowers sessile or pedicellate; calyx deeply lobate, the lobes ovate or lanceolate; corolla white or pale yellow, 4 mm. long, glabrous outside; fruit red, subglobose, 4 mm. long, glabrous, the nutlets coarsely costate dorsally.

Psychotria grandis Swartz, Prodr. Veg. Ind. Occ. 43. 1788.

Moist or wet forest, ranging from sea level to about 1,500 m., sometimes growing in swampy forest; Petén; Alta Verapaz; Izabal; Huehuetenango. British Honduras to Panama and Colombia; West Indies.

A shrub or small tree, sometimes as much as 10 m. high with a trunk 20 cm. in diameter, but usually much smaller; stipules broadly ovate, long-persistent, subulate-acuminate, usually 1.5-2 cm. long, sometimes larger; leaves large, short-petiolate, often subsessile, thick and firm, obovate to broadly oblanceolate, mostly 15-35 cm. long and 5-13 cm. broad, acute or obtuse and often abruptly apiculate, glabrous, the conspicuous lateral nerves about 14 pairs; inflorescence terminal, erect, long-pedunculate, paniculate, commonly 5-7 cm. long and as broad or broader, the stout branches usually puberulent or villosulous, the basal ones usually verticillate, often reflexed, the bracts small and deciduous, the flowers glomerate at the ends of the branches, sessile or short-pedicellate; calyx and hypanthium puberulent or almost glabrous, the calyx subtruncate or remotely dentate; corolla cream or greenish white, about 4 mm. long, glabrous or sparsely puberulent outside, the throat barbate, the obtuse lobes much shorter than the tube; fruit subglobose, 5 mm. long, the nutlets coarsely costate dorsally.

This species really belongs to the subgenus *Psychotria*, but the very large stipules are long-persistent, rather than caducous as is usual in that group.

Psychotria heydei Standl. Journ. Wash. Acad. Sci. 18: 184. 1928. *Flor de San Antonio*.

Moist or wet forest, 2,000-2,600 m.; endemic; Quiché (type from Chiúl, *Heyde & Lux 3173*); Huehuetenango.

Young branches densely villous with short spreading multicellular pale hairs; stipules persistent, united to form a truncate sheath 3-4 mm. long, this densely short-villous; leaves on stout petioles 1.5-4 cm. long, elliptic-oblong, broadest at the middle, 11-26 cm. long, 6-10 cm. broad, acuminate, at the base obtuse to rounded, villous-hirsute above with slender yellowish hairs, densely villous-hirsute beneath, the lateral nerves about 15 pairs; inflorescence terminal, cymose-paniculate, long-pedunculate, erect, much branched, lax, many-flowered, 6-9 cm. long, 8-17 cm. broad, the primary branches opposite or verticillate, divaricate or reflexed, mulberry purple, densely villous-hirsute; bracts persistent, triangular-subulate, 7 mm. long or less; flowers mostly sessile but sometimes on pedicels as much as 8 mm. long; hypanthium 2 mm. long, densely villous; calyx 1.5-2 mm. long, the lobes triangular, subacute; corolla 13-14 mm. long, densely short-villous, white or tinged outside with lavender, the lobes ovate, obtuse, 3 mm. long; anthers included.

A very distinct species because of the very dense, long pubescence, and apparently a rare plant.

Psychotria horizontalis Swartz, Prodr. Veg. Ind. Occ. 44. 1788. *Chalchupa* (Santa Rosa; probably an erroneous name).

Damp thickets or mixed forest, sometimes in pine forest, ranging from sea level to about 1,200 m.; Petén; Izabal; Santa Rosa; Suchitepéquez; Retalhuleu; Huehuetenango. Southern Mexico and British Honduras to Panama, southward to Ecuador; West Indies.

A shrub of 1-3 m., glabrous throughout or nearly so; stipules caducous, ovate-triangular, acute or obtuse, 3-8 mm. long; leaves short-petiolate, often almost sessile, herbaceous, grayish green when dry, elliptic to oblong-lanceolate, mostly 7-11 cm. long and 2.5-5.5 cm. broad, acuminate, at the base acute to obtuse, the lateral nerves about 9 pairs; inflorescence terminal, pedunculate, usually small and dense at first, rather few-flowered, more lax in fruit, commonly 5-rayed at the base, the branches puberulent, the flowers mostly sessile, the bracts caducous, small; calyx deeply 5-lobate, the lobes linear-lanceolate; corolla white, 3-4 mm. long, glabrous outside, the throat not barbate, the lobes half as long as the tube; anthers exserted; fruit red, glabrous, subglobose, 4 mm. long, the nutlets coarsely costate dorsally.

Psychotria izabalensis L. Wms. Phytologia 28: 229. 1974.

Known only from wet forest or thickets near Lake Izabal, Dept. Izabal, *Jones, Proctor & Facey 3024* (type). Endemic.

Shrubs or small trees to 4 m. tall, the stems and leaves glabrous or sparsely pubescent, the inflorescence short pilose pubescent, the stipules persistent, truncate with the erect lateral lobes linear, densely pubescent and about 4-6 mm. long. Leaves membranaceous, broadly elliptic or oblong-elliptic, long acuminate, glabrous except the petioles and nerves on lower surface sparsely puberulent, the blades when mature

15-30 cm. long and 5-11 cm. broad and attenuate into a short 1-2 cm. long petiole; inflorescence terminal, a many-flowered paniculate cyme with the cymules at most subcapitate but usually more open, densely short pilose pubescent, pedunculate, 8-11 cm. long and 4-6 cm. broad, bracts subtending the main divisions linear-lanceolate, about 1 cm. long, bracts in the cymules conspicuous, lanceolate to oblong-lanceolate, acute, sparsely pubescent and ciliate, exceeding the calyx, mostly 3-4 mm. long; hypanthium and calyx small, about 1 mm. long, pubescent, the calyx divided to the base, the lobes triangular-ovate, acute, about 0.5 mm. long; corolla white, crisped-pubescent externally, tube cylindric but broadened and sparsely barbate in the throat, about 4 mm. long, the lobes oblong-lanceolate, acute, about 2 mm. long; stamens inserted in the corolla throat, anthers barely exserted, about 1 mm. long; style as long as the corolla, the stigma lobate; fruits not known.

Related to *Psychotria bracteata* Sw. and the complex of species related to *P. costaricensis* Polak.

Psychotria lilacina Standl. & Steyerl. Field Mus. Bot. 23: 252. 1947.

Wet mixed mountain forest, 1,500-2,800 m.; endemic; Huehuetenango (type from Cerro Huitz, *Steyermark* 48564; also on Cerro Cananá).

A densely branched shrub 1-1.5 m. high, the branches glabrous, the older ones stout, terete, the internodes short; stipules connate into a broad sheath scarcely 0.6 mm. long, bearing on the margin 2 triangular teeth scarcely 0.5 mm. long; leaves small, membranaceous, on petioles 2-5 mm. long, oblong-elliptic to obovate-oblong, 2-5.5 cm. long, 7-22 mm. broad, shortly obtuse-acuminate or obtuse, obtuse to acuminate at the base, glabrous, paler beneath, the nerves obscure on both surfaces, the lateral ones about 6 on each side, arcuate; inflorescences terminal, corymbiform or umbelliform, mostly 3-5-flowered, short-pedunculate, the stout pedicels 1-3 mm. long, glabrous; hypanthium glabrous, columnar, 0.8 mm. long; calyx 3-3.5 mm. long, 5-lobate almost to the base, the lobes lanceolate, ascending or subrecurved above, attenuate-acuminate or sometimes obtuse; corolla lilac, glabrous outside, about 8 mm. long, the tube thick, cylindric, the lobes short, oval.

Psychotria limonensis Krause, Bot. Jahrb. 54: Beibl. 119: 43. 1916. *P. limonensis* var. *laxinervia* Loes. Repert. Sp. Nov. 18: 361. 1922 (type from Palenque, Chiapas).

Wet or moist, mixed forest, or in thickets, usually at 300 m. or less; Petén; Izabal; Escuintla; Chimaltenango; Suchitepéquez; Retalhuleu. Southern Mexico and British Honduras to Panama and Colombia.

An almost glabrous shrub or small tree, commonly 2-4 m. tall; stipules caducous, ovate, acuminate, ferruginous, mostly 2-4 cm. long, attenuate, glabrous; leaves often very large, herbaceous, elliptic-ovate, to broadly elliptic or oblong-elliptic, often as much as 30 cm. long, commonly 6-12 cm. broad but sometimes much broader, subobtuse to abruptly short-acuminate, at the base usually abruptly contracted and

long-decurrent, the lateral nerves 15-20 pairs, petioles 2-9 cm. long; inflorescence terminal (often with lateral branches developing at the side of it), pedunculate, cymose-paniculate or corymbiform, usually equaling or slightly longer than the petioles, many-flowered, dense or lax, usually as broad as long, the branches puberulent or almost glabrous, the bracts small, caducous, the flowers mostly pedicellate; calyx minutely denticulate, about 2 mm. broad; corolla white, mostly about 3 mm. long, glabrous outside, the throat white-barbate, the broad lobes equaling or longer than the tube; fruit oval (or ellipsoid?), 7-9 mm. long, red (possibly black at maturity), the nutlets costate dorsally.

The material placed here may represent two species but flowering specimens are not adequate. The specimens from the western coastal region have ellipsoidal fruits and puberulence on the young leaves and inflorescence while those from the Atlantic coast are glabrous or nearly so and have oval fruits.

Psychotria lundellii Standl. in Lundell, Contr. Univ. Mich. Herb. 4: 29. 1940.

Petén (Uaxactún). British Honduras, the type from Valentín, El Cayo District, *Lundell* 6260.

A shrub or tree 2-6 m. high, said to sometimes attain a height of 13 m. and a trunk diameter of 25 cm., the branches glabrous; stipules caducous, oval, scarcely more than 4 mm. long, broadly rounded at the apex, ferruginous, glabrous; leaves subcoriaceous, on petioles 1-2.5 cm. long, oblanceolate or oblong-oblanceolate, 8-14 cm. long, 2-4.5 cm. broad, narrowly long-acuminate or attenuate-acuminate, gradually long-attenuate to the base, glabrous, sparsely short-barbate beneath in the nerve axils, the lateral nerves about 7 pairs; inflorescence terminal, densely many-flowered, cymose-paniculate, on a peduncle 2 cm. long or less, commonly 4-6 cm. long and 5-8 cm. broad, trichotomous at the base, the branches glabrous or sparsely short-pilosulous, the small bracts soon deciduous, the flowers on short stout pedicels in small dense cymules; hypanthium glabrous, scarcely 1 mm. long, the calyx of equal length, dentate-lobulate, the teeth triangular, acute; corolla white, 2.5 mm. long, glabrous outside, densely white-barbate in the throat, the lobes oblong, acute, equaling the tube; anthers semiexserted; style short-exserted; fruit globose, probably red, 5 mm. long, the nutlets depressed-costate dorsally or almost smooth.

Psychotria macrophylla Ruiz & Pavón, Fl. Peruv. 2: 56, *t.* 202, *f. a.* 1799. *P. anomothyrsa* Schum. & Donn.-Sm. Bot. Gaz. 35: 3. 1903 (type from Cubilgüitz, Alta Verapaz, *Tuerckheim* 7909).

Wet mixed forest, 800-2,300 m.; Alta Verapaz; Izabal; El Progreso; Chiquimula (Cerro Tixixí); Chimaltenango; Sololá; Huehuetenango; Quezaltenango; San Marcos. Southern Mexico and British Honduras to Panama, southward to Bolivia.

Stems usually 1 m. high or less and simple, but sometimes branched and as much as 2.5 m. tall, glabrous or nearly so; stipules persistent or finally deciduous, thin and

pale green, broad, apiculate; leaves large, membranaceous, slender-petiolate, elliptic-oblong to lance-oblong or oblong-oblongeolate, commonly 15-30 cm. long and 6.5-16 cm. broad, often narrower, acuminate or abruptly acute, acute to attenuate at the base, glabrous or pruinose-puberulent beneath on the nerves, sometimes short-hirtellous, the lateral nerves about 14 pairs; inflorescences axillary, cymose-paniculate, usually long-pedunculate, rather few-flowered, the branches often reflexed, glabrous or puberulent, the flowers sessile, the bracts mostly minute; calyx small, denticulate; corolla whitish or yellowish, 4-5 mm. long, glabrous outside; fruit 4-5 mm. long, often somewhat compressed, glabrous, white, with conspicuous cystoliths.

Psychotria marginata Swartz, Prodr. Veg. Ind. Occ. 43. 1788. *P. nicaraguensis* Benth. ex Oerst. Vid. Medd. Kjoebenhavn 1852: 34. 1853. *Oocan cimarrón* (Petén, fide Lundell). Figure 48.

Wet thickets or wet mixed forest, at 600 m. or less; Petén; Alta Verapaz; Izabal; Huehuetenango. British Honduras to Panama, southward to Peru; West Indies.

An almost glabrous shrub, usually about 2 m. high but sometimes as much as 4.5 m., with slender branches; stipules rather large, caducous, ferruginous, membranaceous, oblong to ovate, entire; leaves short-petiolate, firm-membranaceous, usually darkening to a dull gray-black when dried, obovate-oblong to oblanceolate, mostly 9-12 cm. long and 2.5-4 cm. broad, acute or abruptly acute or acuminate, cuneately long-attenuate to the base, minutely puberulent beneath or almost glabrous, the lateral nerves about 12 pairs; inflorescence terminal, long-pedunculate, cymose-paniculate, very lax, sometimes 10 cm. long and 13 cm. broad, the slender pedicels 2-5 mm. long, glabrous or minutely puberulent; calyx small, the teeth short, obtuse; corolla ochroleucous, about 3 mm. long, glabrous outside, the lobes slightly shorter than the tube, the throat not barbate; fruit globose, red, 3-4 mm. long, the carpels coarsely costate dorsally.

Found only on the Atlantic drainage from Mexico to Costa Rica where it crosses over and is also on the Pacific side.

Psychotria microdon (DC.) Urban, Symb. Antill. 9: 539. 1928. *Rondeletia microdon* DC. Prodr. 4: 408. 1830. *P. pinularis* Sessé & Moc. Fl. Mex. ed. 2. 57. 1894. *Mapouria microdon* Bremekamp, Recueil Trav. Bot. Néerl. 31: 286. 1934.

Moist thickets, 900 m. or lower; Petén; Huehuetenango. Mexico to Costa Rica and Panama, southward to Ecuador and the Guianas; West Indies.

A nearly or quite glabrous shrub, usually 1-3 m. high, with pale branches; stipules small, more or less persistent, broadly triangular, sometimes annular and indurate in age; leaves membranaceous, short-petiolate, mostly oblong-obovate, sometimes elliptic, 4-7 cm. long, obtuse to short-acuminate, attenuate to the base, barbate beneath in the nerve axils; inflorescence terminal, cymose-corymbose, few-

flowered, pedunculate, the flowers pedicellate; calyx cupular, truncate, 1 mm. high; corolla white, sometimes 1 cm. long but usually about 8 mm., glabrous; fruit ovoid-globose, about 7 mm. long, not costate dorsally, slightly sulcate on the inner surface.

The flowers are fragrant. In British Honduras the shrub is said to be called "night sage," "dead man's bones," and "hueso de finado." The Maya name "baque-ac" is reported from Yucatan, where the plant is said to be used medicinally by the Indians.

Psychotria minarum Standl. & Steyerl. Field Mus. Bot. 23: 253. 1947.

Moist or wet, mixed, mountain forest, 2,000-3,300 m.; El Progreso (type collected near the summit of Volcán Siglo, growing in colonies in shade of trees and shrubs, *Steyermark 43106*); Zacapa. El Salvador.

A branched shrub 30-90 cm. high, the branches subterete, puberulent or glabrate, with short internodes, the older branches sordid-ochraceous; stipules connate into a very short, truncate sheath, this bearing on the margin at each side a triangular tooth scarcely 0.5 mm. long; leaves small, on slender petioles 4-6 mm. long, membranaceous, blackish when dried, elliptic, oval-elliptic, or oblong-elliptic, 3-6.5 cm. long, 1-2.7 cm. broad, acute or acuminate, often with an obtuse tip, acute or obtuse at the base, glabrous above, paler beneath, glabrous or sometimes scaberulous, especially on the costa and nerves, the lateral nerves 5-6 on each side, inconspicuous, arcuate-ascending, the veins obsolete; inflorescences terminal, on peduncles 1 cm. long or shorter, corymbiform, mostly 3-5-flowered, trichotomous at the base, glabrous or glabrate, much shorter than the leaves, the flowers sessile or on short thick pedicels; hypanthium obconic, 1.2 mm. long, glabrous; calyx scarcely 0.5 mm. long, the teeth triangular, acute; fruit 4.5-5 mm. long, the pyrenes obtusely costate dorsally, one of them often abortive.

Psychotria mombachensis Standl. Field Mus. Bot. 8: 188. 1930. *Tinta de monte*.

Moist mixed lowland forest, about 100 m.; Suchitepéquez (Tiquisate, *Steyermark 47639*). Advanced forest, limestone valley, Valentín, British Honduras; to be expected in Petén. Mexico (Tabasco); Honduras; Nicaragua, the type from Volcán de Mombacho.

A slender shrub about 2 m. high, glabrous throughout, the branches green; stipules persistent, green, 3 mm. long, deeply bilobate, the lobes broadly ovate, obtuse or rounded at the apex; leaves membranaceous, on slender petioles 1-2 cm. long, elliptic-oblong to obovate-oblong or ovate-oblong, 10-17 cm. long, 4-6.5 cm. broad, gradually or abruptly acuminate or long-acuminate, acute to long-attenuate at the base, bright green above, slightly paler beneath, the lateral nerves about 14 pairs; inflorescences terminal, erect, short-pedunculate, on a peduncle about 1 cm. long, cymose-corymbose, lax and rather few-flowered, about 2.5 cm. long and 5 cm. broad,

trichotomous at the base, the few branches bracteate at the base, the bracts subulate, the flowers clustered, sessile; hypanthium cylindric, 1 mm. long, the calyx slightly longer, campanulate, 5-cleft to the middle, the lobes oblong, obtuse; corolla white, glabrous outside, not barbate in the throat, the tube about 13 mm. long, dilated above, the lobes oblong, obtuse, about 3 mm. long.

As known at present, the distribution of this species is rather unusual, but it is to be expected that it will be discovered in El Salvador.

Psychotria nervosa Swartz, Prodr. Veg. Ind. Occ. 43. 1788. *P. undata* Jacq. Hort. Schoenbr. 3: 5, t. 260. 1798. *P. granadensis* Benth. ex Oerst. Vid. Medd. Kjoebenhavn 1852: 34. 1853. *Sacxanal* (Petén, Maya, fide Lundell).

Damp forest or thickets of the lowlands of both slopes, ascending on the Pacific coast to about 1,200 m., but usually at much lower elevations; Petén; Alta Verapaz; Izabal; Escuintla; Sacatepéquez (near Las Lajas); Huehuetenango. Southern Mexico to Panama, extending to Colombia and Venezuela; West Indies; southern Florida.

Usually a shrub about 1 m. high, sometimes as much as 3 m., the branches glabrous; stipules membranous, at first enclosing the terminal buds, later cleft, often 1.5 cm. long, caducous; leaves herbaceous, lanceolate to ovate or oblong-obovate, commonly 6-11 cm. long and 2-5 cm. broad, acuminate, acuminate to attenuate at the base, often with undulate margins, glabrous or glabrate, the lateral nerves elevated and conspicuous beneath, about 10 pairs, the leaves often brownish when dried; inflorescence terminal, sessile or nearly so, cymose-paniculate, mostly 3-5 cm. long, very dense at first but becoming open in fruit, the branches glabrate, the flowers mostly pedicellate; hypanthium narrowly ovoid, longer than the undulate calyx; corolla white, about 6 mm. long, pilose in the throat, the lobes half as long as the tube; fruit red, ellipsoid or oval, conspicuously longer than broad, 6-7 mm. long, the nutlets conspicuously costate.

Psychotria nervosa var. ***rufescens*** (HBK.) L. Wms. Phytologia 26: 492. 1973. *Psychotria rufescens* HBK. Nov. Gen. & Sp. 3: 364. 1819. *P. rufescens* H. & B. ex R. & S. Syst. Veg. 5: 192. 1819. *P. hirta* H. & B. ex R. & S. Syst. Veg. 5: 191. 1819. *P. nervosa* subsp. *rufescens* Steyerl. Mem. N. Y. Bot. Gard. 23: 480. 1972. *P. nervosa* subsp. *rufescens* var. *hirta* Steyerl. l.c. 481.

Damp forest or thickets at low elevations along both coasts, perhaps reaching to 1,200 m.; Petén; Izabal; Sacatepéquez; Escuintla. Mexico and British Honduras, south to Venezuela and Colombia.

Similar to the species but with the branches rufous-hirsute, the stipules ferrugineous, the leaves hirsute to sparsely hirsute, the fruits often hirtellous.

This variation was considered by the senior author to be only a pubescent phase of the species.

Psychotria oerstediana Standl. Contr. U. S. Nat. Herb. 23: 1390. 1926. *Mapouria obovata* Oerst. Amér. Centr. 17, t. 14, f. 3, 4. 1863. *P. obovata* Hemsl. Biol. Cent. Am. Bot. 2: 50. 1881, not Ruiz & Pavón, 1799.

Dry or moist thickets, 400 m. or less; Petén; Alta Verapaz; Retalhuleu. Southern Mexico and British Honduras to Honduras.

A rather stout shrub 1-2.5 m. tall, glabrous or nearly so; stipules caducous, about 1 cm. long or shorter, membranous, ferruginous, obtuse or rounded at the apex, glabrous; leaves on stout petioles, broadly elliptic to obovate or oblong-obovate, mostly 10-13 cm. long and 4-6 cm. broad, acute or abruptly short-acuminate, with obtuse tip, at the base cuneate-attenuate or abruptly acuminate, pale grayish green when dry, rather thick, obscurely domatiate beneath in the nerve axils, the lateral nerves conspicuous, about 8 pairs; inflorescence terminal, usually sessile, many-flowered, at first dense and contracted, in fruit open and lax and sometimes as much as 7 cm. broad, the branches usually glabrous, the bracts caducous, the flowers glomerate, sessile or nearly so; calyx subtruncate, the teeth usually obscure, sometimes evident but broad; corolla white or greenish cream, 5-6 mm. long, glabrous outside, the lobes reflexed, much shorter than the tube; anthers often exserted; fruit red, 5-7 mm. long, oval or ellipsoid, glabrous, the nutlets conspicuously costate dorsally.

Psychotria officinalis (Aubl.) Sandwith, Kew Bull. 1931: 473. 1931. *Nonatelia officinalis* Aubl. Pl. Guian. 1: 182, t. 70, fig. 1. 1775. *Psychotria involucrata* Sw. Fl. Ind. Occ. 1: 413. 1797.

Wet mixed forest or thickets, mostly at less than 350 m.; Petén; Alta Verapaz; Izabal; Huehuetenango. Southern Mexico and British Honduras to Panama; Colombia and Venezuela; West Indies.

An almost glabrous shrub, commonly 3 m. high or less, with slender but rigid, green branches; stipules persistent, short, green, the lobes very short, acute or acuminate; leaves short-petiolate, thin, bright green when dried, lanceolate to elliptic-ovate or rhombic-ovate, commonly 9-18 cm. long and 4-8 cm. broad, abruptly long-acuminate, contracted and long-decurrent at the base, the lateral nerves about 12 pairs, very slender; inflorescence terminal, erect or recurved, pedunculate, subcapitate and commonly 1-2 cm. long, few-flowered, in age becoming more open and often racemiform, the short branches usually purplish, hirtellous, the flowers sessile or nearly so and densely capitate-glomerate at the ends of the stout branches; outer bracts narrow and often much exceeding the flowers, purple or purplish, the inner bracts shorter, broad, conspicuous; calyx minute, denticulate; corolla white or

ochroleucous, 4-5 mm. long, hirtellous outside, the lobes much shorter than the tube; fruit globose, 4 mm. long, black at maturity, the nutlets coarsely costate dorsally.

Somewhat variable in the form of the inflorescence, and it is possible that the Central American material embraces more than a single species, although the variations perhaps represent only different stages in the development from flower to fruit.

***Psychotria oreodoxa* L. Wms. Phytologia 28: 230. 1974. Chile.**

Moist forests on the Pacific slopes of the western highlands, 1,000-1,500 m. or perhaps higher; Sololá; Suchitepéquez; Quezaltenango. Endemic.

Shrubs to 5 m. tall, branched, the branches glabrous or obscurely puberulent, stipules persistent, about 3 mm. long, bilobate laterally with aceriform lobes. Leaves elliptic or elliptic-oblongate, long acuminate, attenuate to the slender petiole, glabrous, with about 10 pairs of secondary nerves, the blades 10-18 cm. long and 2-5 cm. broad, petioles slender, mostly 1-3 cm. long; inflorescence terminal, thyriform, pedunculate, to about 7 cm. long; flowers white, abundant; hypanthium and calyx 1-1.5 mm. long, the calyx short, the lobes narrowly triangular, acute, about 0.5 mm. long; the corolla small, tubular below and slightly expanded above, about 5-6 mm. long, the lobes small, oblong; stamens inserted in the corolla throat and anthers exerted and about 1.5 mm. long; fruit very fleshy, purple-black, the seeds about 2.5 mm. long, obscurely ridged.

***Psychotria orogenes* L. Wms. Phytologia 28: 231. 1974.**

Wet montane cloud forests at 1,400-1,600 m.; Alta Verapaz; Baja Verapaz (type, *Williams, Molina & Williams 41924*). Endemic.

Shrubs or weak trees 3-4 m. tall, the branches densely villous pubescent with short spreading hairs, the stipules persistent, joined and surrounding the branches, each pubescent stipule with a lateral pair of linear-lanceolate lobes 3-4 mm. long. Leaves elliptic or elliptic-oblongate, acuminate, sparsely pilose above, prominently and softly so beneath, with mostly 13-16 pairs of lateral nerves, the blade 8-15 cm. long and 1.5-4 cm. broad, petioles short, 0.7-1.5 cm. long; inflorescence terminal, a pedunculate panicle of cymules up to about 6 cm. long, conspicuously soft pilose when immature but less so in fruit, bracteolate, the bracts linear-filiform, those of the main branches 1 cm. long, those subtending flowers smaller; flowers white, conspicuously short pilose, usually subtended by a filiform bract about as long as the calyx; hypanthium and calyx 1-1.5 mm. long, villous; calyx very small, the lobes lance-triangular, about 0.5 mm. long; corolla small, 4-5 mm. long, short villous outside, the lobes oblong, acute, about 2 mm. long; fruits subglobose, pilose, prominently ridged, 4-5 mm. long.

A montane cloud forest species somewhat related to *Psychotria pubescens* Sw.

***Psychotria pachecoana* Standl. & Steyerl. Field Mus. Bot. 22: 205. 1940.**

Damp mixed forest or wet thickets, 1,400-2,500 m.; endemic; Alta Verapaz (region of Tactic); Baja Verapaz (type from region of Santa Rosa, *Standley 69922*); El Progreso; Zacapa (Sierra de las Minas); Huehuetenango.

A branched shrub about 2 m. tall, the branches densely pilosulous; stipules persistent, the sheath 4 mm. long, the lobes remote, 3-4 mm. long, triangular-attenuate; leaves membranaceous, short-petiolate, oblong-ob lanceolate or narrowly oblong-ob lanceolate, 7-15 cm. long, 2-4 cm. broad, narrowly long-attenuate, cuneately narrowed to the base, densely pilose above with short, spreading or subappressed hairs, somewhat paler beneath, densely velutinous-pilose, the lateral nerves about 20 pairs; inflorescence terminal, erect, on a peduncle 1.5-2 cm. long, cymose-paniculate, in fruit 3.5-5 cm. long and as much as 7 cm. broad, in flower smaller and denser, the branches all bracteate at the base, hispidulous-pilose, the bracts almost subulate, 4 mm. long or less, the flowers sessile, densely crowded; corolla greenish white, hispidulous; fruit subglobose, 4 mm. long, sparsely hirtellous, the nutlets coarsely costate dorsally.

The species was named for Don Mariano Pacheco Herrarte, Director General de Agricultura of Guatemala for many years and friend of the senior author.

Psychotria parasitica Swartz, Prodr. Veg. Ind. Occ. 44. 1788. *Viscoides pendulum* Jacq. Sel. Stirp. Amer. 73, t. 51, f. 1. 1763. *P. pendula* Urban, Symb. Antill. 1: 445. 1899, not Hook. f. 1882.

Moist or wet forest, 1,500 m. or usually much lower; Alta Verapaz. *Viscoides pendulum* Jacq. Sel. Stirp. Amer. 73, t. 51, f. 1. 1763. *P. pendula* Urban, Symb. Antill. 1: 445. 1899, not Hook. f. 1882.

A glabrous epiphytic shrub with dark terete branches, often pendent; stipules 2-3 mm. long, united to form a truncate sheath, this persistent and becoming indurate and pale in age; leaves very thick and fleshy, short-petiolate, broadly ovate to elliptic-oblong, mostly 2-10 cm. long and 1.5-2.5 cm. broad, obtuse to acuminate, obtuse or rounded at the base, the costa conspicuous but the lateral nerves obsolete; inflorescence terminal, erect, small and few-flowered, pedunculate, the flowers sessile or on short thick pedicels; calyx dentate, small, the teeth triangular; corolla white, 6-7 mm. long or shorter, glabrous outside; fruit obovoid-globose, red, 3.5-4 mm. long, the nutlets smooth or nearly so dorsally.

Unlike any other Guatemalan species in its epiphytic habit and thick fleshy leaves.

Psychotria parvifolia Benth. ex Oerst. Vid. Medd. Kjoebenhavn 1852: 36. 1853.

Dense damp mixed forest of the slopes of the western highlands, 1,300-2,000 m.; Quezaltenango (southern slopes of Volcán

de Santa María); San Marcos (Volcán de Tajumulco). Costa Rica and Panama.

A slender, usually densely branched and very leafy shrub 1-2 m. tall, the branches puberulent or short-pilose; stipules ovate, caducous, ferruginous, about 4 mm. long, often villosulous; leaves small, membranaceous, slender-petiolate, chiefly oblong-lanceolate or narrowly elliptic-lanceolate, mostly 3.5-5.5 cm. long and 1-1.5 cm. broad, subobtuse to long-attenuate, usually long-attenuate and decurrent at the base, the margins often somewhat undulate, blackening when dried, glabrous, usually minutely domatiate beneath in the nerve axils, the lateral nerves obscure, about 7 pairs; inflorescence terminal, erect, cymose-paniculate, sessile, small and few-flowered, the flowers mostly sessile, the bracts caducous; calyx obscurely dentate; corolla white, 4 mm. long or less, glabrous outside, barbate in the throat; fruit globose, red, about 4 mm. in diameter, the nutlets rather inconspicuously costate dorsally.

Psychotria patens Swartz, Prodr. Veg. Ind. Occ. 45. 1788. *P. flexuosa* Willd. Sp. Pl. 1: 966. 1798.

Wet mixed forest or sometimes in second growth, 500 m. or less; Alta Verapaz; Izabal; Huehuetenango; to be expected in Petén. Southern Mexico and British Honduras to Bolivia and Brazil. West Indies.

A slender glabrous shrub commonly 1-3 m. tall, with green or yellowish branches; stipules small, persistent, green, biaristate; leaves thin but stiff, drying green and lustrous, lanceolate to lance-oblong, mostly 10-15 cm. long and 3.5-5.5 cm. broad, narrowly long-acuminate, obtuse or acute at the base, the lateral nerves about 7 pairs; inflorescence terminal, erect, slender-pedunculate, thyrsoid-paniculate, often elongate, the short slender branches mostly reflexed, not bracteate at the base, the flowers sessile or short-pedicellate; calyx minute, with triangular teeth; corolla white or whitish, glabrous outside, 7 mm. long, the lobes very short; fruit subglobose or often somewhat didymous, white or pale blue at maturity, 3 mm. long, the nutlets costate dorsally.

Psychotria pittieri Standl. Contr. U. S. Nat. Herb. 18: 132. 1916.

Wet mixed forest or in thickets, 300-500 m.; Alta Verapaz (Montaña Yxocubvain, *Steyermark 44994*). Costa Rica; Panama.

A slender shrub 1-2 m. high, often densely branched, the branches pilose with rather long, pale, appressed or spreading hairs; stipules persistent, 4-6 mm. long, bilobate, the lobes subulate; leaves small, short-petiolate, elliptic-oblong, mostly 4-6 cm. long and 1.5-2.5 cm. broad, occasionally somewhat larger, green above, hirsutulous along the costa, appressed-pilose beneath; inflorescence terminal, reflexed in age, cymose-paniculate, slender-pedunculate, commonly about 2 cm. long, rather few-flowered, the branches pilose, the flowers subsessile; calyx 1 mm. long, the lobes obtuse; corolla white, 4-5 mm. long, minutely appressed-pilose; fruits small, blue, pilose with long white hairs.

The only known collection in Guatemala is not in good condition.

***Psychotria pleuropoda* Donn.-Sm. Bot. Gaz. 40: 5. 1905.**

Moist or wet mixed forest, often on limestone, 900 m. or lower; Petén; Alta Verapaz (type from Cubilgüitz, *Tuerckheim* 8529); Izabal. British Honduras.

A glabrous shrub 1-4.5 m. high; stipules caducous, membranaceous, ferruginous, more or less connate, 10-13 mm. long, bifid at the apex, the lobes linear-setaceous, ciliate; leaves herbaceous, blackening when dried, lance-linear, 10-20 cm. long and 1.5-2.5 cm. broad, long-attenuate to the apex, acute at the base, the lateral nerves obscure; inflorescence axillary, long-pedunculate, cymose, usually dense and head-like with few branches, the peduncle as much as 8 cm. long, the flowers mostly on pedicels 1.5 mm. long or less; calyx lobes ovate, 0.5 mm. long; corolla white, 6 mm. long, the lobes about equaling the tube, oblong, reflexed; fruit red, oval, 5-6 mm. long, the nutlets 4-costate dorsally, not sulcate on the inner surface.

An isolated species easily recognized by the long and narrow leaves and axillary inflorescences. Referable to the subgenus *Psychotria*.

***Psychotria pubescens* Swartz, Prodr. Veg. Ind. Occ. 44. 1788.**
P. justicioides Schlecht. Linnaea 9: 596. 1834. *Chalchupa* (Santa Rosa, perhaps an erroneous name); *zac-ixcanan* (Petén, Maya, fide Lundell); *guayabeño* (fide Aguilar).

Damp thickets or wet mixed forest, chiefly in the hot country but ascending to about 1,500 m., but most common at low elevations; Petén; Alta Verapaz; Izabal; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Sacatepéquez; Sololá; Retalhuleu; Quezaltenango; Huehuetenango; San Marcos. Mexico to Panama; West Indies.

A shrub mostly 1.5-3 m. high, the branches often constricted at the nodes when dry, puberulent or short-pilose; stipules small, deeply bifid, the lobes acute or acuminate; leaves membranaceous, usually green when dried, petiolate, elliptic to oblong-lanceolate, mostly 7-15 cm. long and 3-7 cm. broad, acuminate, acute to attenuate at the base, often rough to the touch on the upper surface and minutely pilosulous or scaberulous, slightly paler beneath, usually puberulent or finely short-pilose, the lateral nerves about 11 pairs; inflorescence terminal, cymose-corymbose, usually pedunculate, many-flowered, the branches densely short-pilose, the flowers sessile or nearly so; calyx lobes ovate, very small; corolla greenish white or greenish yellow, 4-5 mm. long, usually puberulent pilose in the throat, the oblong lobes shorter than the tube; fruit subglobose, juicy, black or dark purple, 3-4 mm. long, the nutlets acutely costate dorsally.

Psychotria purpusii Standl. Contr. U. S. Nat. Herb. 23: 1388. 1926.

San Marcos, slopes of Volcán de Tajumulco, about 2,000 m., wet mixed forest. Mexico (Chiapas), the type from Cerro del Boquerón, *Purpus* 7012.

A shrub or small tree 1.5-7 m. tall, the branches densely soft-villous; stipules persistent, small, the lobes remote, ovate, obtuse; leaves large, membranaceous, slender-petiolate, elliptic or oval, 10-21 cm. long and 4-10 cm. broad, abruptly acuminate, acute to almost rounded at the base, soft-pilose on both surfaces, more densely so beneath, the lateral nerves about 14 pairs; inflorescence terminal or pseudolateral, on very long peduncles, often nutant, subtending bracts lanceolate or sometimes broader, head-like with 3 short branches, in fruit sometimes more open, the bracts usually about equaling the flowers, orange and green, oblong or lanceolate, 2.5 cm. long or shorter, acute or acuminate, the flowers sessile or short-pedicellate; corolla about 15 mm. long, white, the short lobes erect, very obtuse; fruit subglobose, 7 mm. long, densely pilose, white, the hairs mustard yellow.

An unusually well-marked species, almost equally well referable to the genus *Cephaelis*, noteworthy for the very large and brightly colored bracts subtending the headlike inflorescence, also for the abundant soft dense pubescence of the leaves.

Psychotria schippii Standl. & Steyerl. Field Mus. Bot. 23: 24. 1943.

Petén (Uaxactún). British Honduras, the type from advanced forest, limestone valley, Valentín, El Cayo District, *Lundell* 6193.

A glabrous shrub or tree, often 5-9 m. high, the trunk often 5-10 cm. in diameter; stipules caducous, 1.5 cm. long or less, ferruginous, firm, attenuate; leaves rather large, on petioles 1-2.5 cm. long, firm or subcoriaceous, elliptic or oblong-elliptic, 11-19 cm. long, 5-9.5 cm. broad, abruptly acuminate or caudate-acuminate, at the base acute or abruptly contracted and long-decurrent, grayish green above when dried, lustrous, the costa and nerves prominent, minutely and sparsely barbate beneath in the nerve axils, the lateral nerves very conspicuous, about 14 on each side; inflorescence terminal, sessile, cymose-paniculate, abundantly branched in fruiting state, many-flowered and lax, 6 cm. long and 8 cm. broad or smaller, the bracts caducous, the flowers sessile; fruit red, glabrous, globose, 4-5 mm. in diameter, rounded at the base and apex, the nutlets obtusely costate dorsally; calyx teeth minute, obtuse and rounded.

Psychotria simiarum Standl. Field Mus. Bot. 4: 344. 1929.

Wet forests or thickets, at 700 m. or less; Alta Verapaz; Izabal. British Honduras; Honduras, the type from Lancetilla valley near Tela.

A shrub or small tree 2-7.5 m. high, the slender branches green, glabrous, constricted at the nodes when dry; stipules persistent, green 1-2 mm. long, connate

into a sheath, this bidentate at the apex; leaves membranaceous, on slender petioles 1-2.5 cm. long, elliptic or oblong-elliptic, 8-15 cm. long, 2.5-7 cm. broad, abruptly long-acuminate, acute at the base, glabrous, slightly paler beneath, the lateral nerves about 7 pairs; inflorescence terminal, erect, pedunculate, cymose-paniculate, densely many-flowered, about 2 cm. long and 2.5 cm. broad, but in age often larger, the branches minutely puberulent, bracteate at the base, the bracts small, green, linear or subulate, the flowers sessile or on very short pedicels; hypanthium 0.8 mm. long, puberulent or glabrous, the calyx about the same length, short-dentate, the teeth unequal, triangular or broadly ovate, obtuse or acute; corolla ochroleucous, about 3 mm. long, minutely pruinose-puberulent, the lobes oblong, obtuse, almost equaling the tube; fruits subglobose, blue, glabrous, 5-6 mm. in diameter, the nutlets obscurely costate dorsally, narrowly sulcate on the inner surface.

***Psychotria skutchii* Standl. Field Mus. Bot. 17: 283. 1937.**

Moist or wet mixed forest, 1,500-2,400 m.; endemic; Suchitepéquez; Huehuetenango (type from San Juan Ixcay, 2,400 m., in oak forest, *Skutch 1074*); Mexico (Chiapas).

A shrub or small tree 1-2.5 m. tall or more, the slender branches densely pilosulous with short spreading sordid hairs; stipules persistent, the sheath 1.5 mm. long, the lobes triangular-subulate; leaves small, on slender petioles 7-15 mm. long, narrowly elliptic-oblong or oblanceolate-oblong, 6-9.5 cm. long, 2-3 cm. broad, long acuminate, narrowed to the acute or acuminate base, densely puberulent above and spreading-pilosulous along the costa, densely and softly pilosulous beneath, the lateral nerves about 13 pairs; inflorescence terminal, erect, sessile or slender-pedunculate, cymose-paniculate, 2.5-4.5 cm. long, trichotomous at the base, the branches spreading or somewhat reflexed, bracteate at the base, densely pilosulous with spreading hairs, the flowers sessile or on very short pedicels; hypanthium and calyx densely pilose, the calyx 1 mm. long, unequally dentate, the teeth triangular, subacute; corolla white, pilosulous, the tube 6-8 mm. long, the throat not barbate, the lobes triangular-oblong, obtuse, shorter than the tube, glabrous within; anthers semi-exserted; style equaling the corolla lobes.

***Psychotria steyermarkii* Standl. Field Mus. Bot. 22: 387. 1940.**

Damp mixed forest, 1,200-2,000 m., Quezaltenango, the type from Quebrada de San Gerónimo, Finca Pirineos, *Steyermark 33461*.

A slender shrub about 1.5 m. high, the young branches green, at first pilose with short spreading hairs; stipules persistent, 8-9 mm. long, bilobate almost to the base, the lobes linear or almost subulate, attenuate, puberulent at the base; leaves membranaceous, on slender petioles 1-2 cm. long, narrowly oblong-lanceolate to almost linear-lanceolate, 5-14 cm. long, 1.5-2.5 cm. broad, narrowly attenuate-acuminate, long-attenuate to the acute or acuminate base, green above, pilose along the costa, paler beneath, sordid-pilosulous on the nerves and costa or puberulent, the lateral nerves about 23 pairs; inflorescence terminal, sometimes apparently recurved, on a peduncle 3.5 cm. long or shorter, cymose, trichotomous at the base, about 3 cm. long and broad, the branches all bracteate at the base, glabrous or glabrate, the

flowers crowded in a few head-like clusters, sessile or short pedicellate, the lowest bracts foliaceous, linear-lanceolate, about 1 cm. long, acuminate-attenuate; calyx 1.5-2 mm. long, dentate, the teeth ovate, acute; fruit subglobose, 4 mm. long, glabrous, the nutlets coarsely costate dorsally.

The species is known only from the valley of the Río Samalá, in the vicinity of the type locality.

***Psychotria tenuifolia* Swartz, Prodr. Veg. Ind. Occ. 43. 1788.**
***P. sessilifolia* Mart. & Gal. Bull. Acad. Brux. 11, pt. 1: 228. 1844.**

Moist or wet thickets or damp mixed forest, chiefly in the plains and foothills, ascending to about 1,200 m. but mostly at lower elevations; Petén; Alta Verapaz; Santa Rosa; Escuintla; Chimaltenango (Sibajá); Huehuetenango. Southern Mexico and British Honduras to Honduras; West Indies.

A shrub, usually 1-2 m. high, often even lower but sometimes as much as 4 m., the branches green, usually puberulent; stipules caducuous, membranous, ferruginous, 1 cm. long or less, usually bilobate at the apex, the lobes subulate-acuminate; leaves short petiolate, oblong-elliptic to narrowly oblong-lanceolate, mostly 9-16 cm. long and 1.5-5.5 cm. broad, acute to acuminate or attenuate, usually long-attenuate to the base, membranaceous, usually dark when dried, puberulent or minutely pilose beneath or glabrate, usually glabrous above, slightly paler beneath, the lateral nerves about 12-14; inflorescence terminal, sessile, cymose-paniculate, often appearing axillary because of elongation of the branch, small and few-flowered or often many-flowered and as much as 6 cm. long, rather lax in fruit, the bracts caducous, the branches puberulent or densely short-pilose, the flowers sessile or on very short pedicels; calyx about 1 mm. broad, very short, shallowly dentate; corolla white, about 3 mm. long, glabrous or sparsely puberulent outside, the lobes equaling the tube; fruit bright red, globose, 4-5 mm. long, the nutlets obtusely costate dorsally.

Although dull when dried, the leaves often are lustrous in the fresh state.

***Psychotria uliginosa* Swartz, Prodr. Veg. Ind. Occ. 43. 1788.**
***Notopleura uliginosa* Bremekamp, Recueil Trav. Bot. Néerl. 31: 290. 1934.**

Wet mixed forest, 2,600 m. or less; Alta Verapaz; Izabal; Chiquimula (Cerro Tixixí); Sololá; Huehuetenango; Quezaltenango; San Marcos. Southern Mexico and British Honduras to Panama and the Guianas; West Indies.

A stout shrub or herb, usually simple and about 1 m. high or less, sometimes taller, glabrous throughout or nearly so; stipules persistent, ovate-triangular, acute, the upper portion soon decaying; leaves large, thick and succulent in the living state, on petioles 4 cm. long or less, oblanceolate-oblong to elliptic-oblong or obovate, as much as 25 cm. long and 10 cm. broad but usually somewhat smaller, acute or abruptly short-acuminate, acute at the base, deep green above, pale beneath, the

lateral nerves about 15 pairs, inconspicuous; inflorescences axillary, long-pedunculate, cymose-paniculate, the branches bracteate at the base, the flowers capitate or glomerate at the ends of the branches; calyx cupular, irregularly dentate; corolla white, about 9 mm. long, the lobes acute, half as long as the tube; fruit bright red, juicy, 7-8 mm. long, the nutlets conspicuously carinate dorsally, strongly compressed.

A rather handsome plant when well grown because of the brilliant red fruits. The plant thrives best in very wet and dense forest at 1,200-1,500 m.

Psychotria viridis Ruiz & Pavón, Fl. Peruv. 2: 61, *t.* 210, *f.* b. 1799. *P. glomerata* HBK. Nov. Gen. & Sp. 3: 363. 1820. *P. microdesmia* Oerst. Vid. Medd. Kjoebenhavn 1852: 36. 1853.

Moist or wet thickets or forest, on limestone, 150 m. or less; Petén. Collected at Cocquericot, British Honduras; Costa Rica and Panama; southward to Bolivia and the Guianas; Cuba.

A slender shrub 1.5-4.5 m. high, glabrous or nearly so; stipules caducous, 1-1.5 cm. long, membranous, ferruginous, bifid at the apex, with acute or acuminate lobes, glabrous; leaves darkening when dried, on short petioles or almost sessile, rather thick and firm, obovate or obovate-oblong, mostly 8-16 cm. long and 3-5 cm. broad, acute or subacuminate, cuneately attenuate to the base; inflorescence terminal, pedunculate, the flowers glomerate and sessile, the glomerules spicate along the branches of a sparsely branched, small or rather large panicle, the bracts small and inconspicuous, caducous; calyx small and very short, truncate or obscurely dentate; corolla white and very small; fruit red, globose, 4-5 mm. long, the nutlets costate dorsally.

Easily recognized because of the spikelike branches of the inflorescence.

Psychotria yunckeri Standl. in Yuncker, Field Mus. Bot. 17: 397. 1938.

A forest or cloud forest species of middle to rather high elevations, 1,000-1,800 m.; Jalapa; Quezaltenango; San Marcos. Honduras (type, *Yuncker et al.* 6013).

A shrub or small tree 2-8 m. tall, entirely glabrous, the stipules caducous, connate at first, calyptriform, to 3.5 cm. long and 3.5 mm. broad; leaves elliptic or elliptic-oblong, acuminate, attenuate or subdecurent at the base, 10-20 cm. long and 4-9 cm. broad, lateral nerves about 15 pairs, the petiole of mature leaves to 7 cm. long; inflorescence terminal, cymose-paniculate, many-flowered, pedunculate, to about 10 cm. long; flowers white or greenish, short pedicellate or sessile; hypanthium obovoid, about 1.5 mm. long, the calyx truncate or obscurely dentate, about 1 mm. long; corolla broadly cylindric, about 5 mm. long, glabrous outside, barbate in the throat, the lobes ovate-oblong and nearly as long as the tube; fruits ovoid or globose, to 7-8 mm. long.

This is one of the several species often referred to *P. trichotoma* Mart. & Gal., a Mexican species that may not occur in Central America.

RANDIA Linnaeus

Trees or shrubs, usually armed with axillary or supra-axillary spines, the spines often borne at the ends of the branches; stipules small, intra-petiolar; leaves opposite, sessile or petiolate, membranaceous or coriaceous; inflorescences axillary or terminal; flowers solitary or fasciculate, small or large, perfect or unisexual, usually white, sometimes yellowish; hypanthium ovoid, obovoid, or turbinate, terete or costate; calyx usually tubular, and lobate, the lobes often elongate or foliaceous; corolla generally salverform, with short or elongate tube, the throat glabrous or villous, the limb usually 5-lobate, the lobes short or elongate, acute or obtuse, contorted in bud; stamens 5, inserted in the corolla throat, the filaments short or obsolete; anthers dorsifixed, linear, obtuse to acuminate, included or exserted; ovary commonly 2-celled, the style glabrous or pilose, the stigma clavate or fusiform, entire or bilobate; ovules numerous, immersed in fleshy placentae, these affixed to the septum; fruit baccate, globose or oval, 2-celled, the pericarp thick and hard or soft and thin, usually smooth, sometimes tuberculate; seeds numerous or few, immersed in pulp, commonly horizontal, compressed, the testa usually thin.

There are about 200 species of *Randia* distributed in the tropics of both hemispheres. Sixty-five species have been described from Mexico, Central America, and Panama. The genus is a complex one easily divided into two subgenera in our region. *Basancantha* Hook. f. which was distinguished by its author on the basis of unisexual flowers is of doubtful validity. The genus in North America is much in need of revision and until this is done no satisfactory account of the species can be written. Much of the material in herbaria is sterile or fragmentary so that revisionary work would be difficult. The unisexual flowers and perhaps dioecious plants of part of the species would not make easier revisionary work.

Corolla 25-70 mm. long, rarely slightly shorter; fruit (unknown in *R. pleiomeris*) 3-8 cm. long; flowers often or always unisexual; spines often in 4's at the ends of the branches. [Subgenus *Basancantha* (Hook. f.) L. Wms.].

Leaves rounded at the apex, almost glabrous, 1-2 cm. long*R. pleiomeris*.

Leaves acute or acuminate, rarely obtuse or rounded at the apex but then densely pubescent and 4-10 cm. long or larger.

Leaves densely tomentose beneath with pale matted hairs, obtuse or rounded at the apex*R. habrophlebia*.

Leaves glabrous beneath or hirsute or pilose with straight, not matted, usually somewhat appressed hairs, acute or acuminate.

Leaves mostly glabrous beneath or nearly so; corolla usually glabrous, sometimes puberulent or sparsely short-pilose; fruit usually longer than broad.....*R. armata*.

Leaves densely pilose or hirsute beneath, especially when young; corolla densely pilose with long, white, appressed or spreading hairs; fruit globose.

Corolla tube 3.5-4 cm. long or longer.

Calyx lobes linear or linear-cuneiform, about 6 mm. long*R. monantha*.

Calyx lobes filiform, 10-25 mm. long.....*R. gentlei*.

Corolla tube about 1.5 cm. long*R. lundelliana*.

Corolla 5-20 mm. long, rarely somewhat larger; fruits small, usually less than 2 cm. long; flowers perfect; spines chiefly in pairs along the branches. [Subgenus *Randia*].

Fruit or ovary pilose with spreading hairs*R. standleyana*.

Fruit and ovary glabrous or appressed-pilose.

Leaves densely short pilose on both surfaces; corolla 12-20 mm. long.

R. letreroana.

Leaves glabrous or sparsely pilose below; corolla 5-10 mm. long.

Corolla naked in the throat.....*R. cookii*.

Corolla white-barbate in the throat.

Corolla 4-5 mm. long, the lobes apiculate, shorter than the tube.

R. guatemalensis.

Corolla 6-8 mm. long, the lobes acute or acuminate, equaling or longer than the tube.....*R. aculeata*.

***Randia aculeata* L. Sp. Pl. 1192. 1753. *R. mitis* L. l.c.**

Dry hillsides and thickets at relatively low elevations, possible along most Caribbean shores from Florida and the West Indies to northern South America. In Guatemala possibly only in Petén and Izabal. British Honduras and along the Caribbean coast to Panama.

A stout, usually densely branched shrub 1-3 m. high, rarely a small tree, the branchlets glabrous or often scaberulous or appressed-pilose, usually bearing at the apex 2 stout spines 1.5 cm. long or less; leaves mostly clustered at the ends of the branches or on short lateral spurs; stipules 2 mm. long or less, ovate-deltoid, generally acuminate, pilose within at the base; petioles very short or none, usually marginate to the base; leaf blades very variable in shape and size, mostly obovate or obovate-orbicular but often orbicular to elliptic-oblong or rhombic-ovate, commonly 1-6 cm. long and 0.5-3 cm. broad but often considerably larger, acute to broadly rounded at the apex, broadly rounded to attenuate at the base, coriaceous at maturity, usually lustrous and glabrous above, glabrous beneath or sparsely pilose along the costa; flowers perfect, terminal, sessile, often clustered; calyx and hypanthium 2-3 mm. long, usually glabrous, the calyx lobes linear to ovate, generally much shorter than the hypanthium, often ciliolate; corolla white, 6-8 mm. long, glabrous outside, the 5 lobes ovate or ovate-oblong, acute or acuminate, equaling or longer than the tube, the throat very densely white-barbate; anthers exserted; fruit globose, 6-13 mm. in diameter, usually smooth and glabrous; seeds commonly 5-10, brownish black, 4-5 mm. long.

It is difficult to delimit *Randia aculeata* and until someone finds the time to revise the genus no satisfactory account can be given of this entity. Herbaria contain a very large number of collections more often than not without flowers. The name *R.*

aculeata has been appended to material collected at sea level up to 2,000 m. and from several ecological situations over much of Mexico and Central America by the authors of this work, and by many other botanists as well. Certainly some of these plants are not of the same species and the highlands of Guatemala definitely support allied species not accounted for in the treatment presented here.

Randia armata (Swartz) DC. Prodr. 4: 387. 1830. *Mussaenda spinosa* Jacq. Sel. Stirp. Am. 70. 1763. *Gardenia armata* Swartz, Prodr. Ind. Occ. 51. 1788. *Randia ovata* Duchass. ex Griseb. Bonplandia 6: 8. 1858. *R. spinosa* Karst. Fl. Columb. 2: 128, t. 167. 1866, not *R. spinosa* Poir. 1811. *Basanacantha spinosa* var. *guatemalensis* Schum. ex Loes. Verh. Bot. Ver. Brandenb. 65: 110. 1923 (type collected in forest below Alotenango, Sacatepéquez, *Seler* 2570). *Flor de cruz*; *palo de cruz*; *crucito*; *rosetillo*; *torolillo*.

Dry or moist thickets or forest of the lowlands of both coasts, ascending in the Pacific *bocacosta* to about 1,200 m.; Petén; Izabal; Santa Rosa; Baja Verapaz (seen but not collected); Guatemala (?); Escuintla; Sacatepéquez; Suchitepéquez; Retalhuleu; doubtless in all the Pacific coast departments. Mexico to Panama, southward to Argentina.

A shrub or small tree 2-9 m. high, the branchlets appressed-pilose or almost glabrous, usually bearing at the apex 4 stout spines 1-2.5 cm. long; bark thin, brown, fibrous; stipules broadly ovate, 3-8 mm. long, mucronate-acuminate, thin, brownish; leaves commonly membranaceous, on slender petioles 2 cm. long or less, variable in shape, mostly ovate, oblong-ovate, oval, or obovate, 6-20 cm. long, 2-10 cm. broad, acute or abruptly acuminate, at the base acute or acuminate, bright green above, glabrous or sparsely puberulent, beneath puberulent or minutely appressed-pilose along the veins or almost glabrous; flowers perfect, slender-pedicellate, fragrant, 2-8 at the end of each branchlet, the pedicels glabrous or puberulent; calyx and hypanthium glabrous or puberulent, the 5 calyx lobes linear to obovate-oblong, 4-9 mm. long, acute or acuminate; corolla white or ochroleucous, glabrous outside or sparsely pilose or short-villous, the tube 2-2.5 cm. long, the throat naked, the 5 lobes rhombic-obovate, 1 cm. long, obtuse; fruit usually oval, 1.5-3.5 cm. long, smooth or obscurely costate, the pulp at maturity black, sweetish; seeds numerous, suborbicular, brown, 4-6 mm. broad.

Known in Honduras by the names "cagalera," "crucetilla," and "jasmín cimarrón," "caca de mico," "jicarillo" (El Salvador). The flowers are sweet-scented. The ripe fruit has a hard but rather thin shell that is readily punctured by some birds, which seem to be fond of the pulp and seeds. This pulp sometimes is eaten by people, but its black color makes it repulsive in appearance and the flavor is

unpleasant. The fruit is said to have been used in the Antilles for stupefying fish and the wood is employed for fuel.

Randia cookii Standl. N. Am. Fl. 32: 176. 1934. *Crucita; naranjillo; conchitám* (Huehuetenango).

Dry or moist thickets, often on rocky hillsides, 800-2,100 m.; Baja Verapaz, the type from Santa Rosa, *O. F. Cook* 249; Huehuetenango. Mexico (Chiapas); Honduras.

A very densely branched shrub 1-2 m. high, the branches appressed-pilose at first, the spines in pairs along or at the tips of branches, 6-9 mm. long; leaves mostly clustered on short lateral spurs, often blackening in drying; stipules 1.5-3 mm. long, rounded-deltoid, acuminate, glabrous within; petioles 1-1.5 mm. long; leaf blades obovate or rounded-obovate to oval-oblong or obovate-oblong, 1-3.5 cm. long, 6-12 mm. broad, acutish to rounded at the apex, obtuse to acuminate at the base, coriaceous or subcoriaceous, glabrous and lustrous above, glabrous beneath or sparsely scaberrulous on the costa, the margin often revolute; flowers perfect, terminal and mostly solitary, sessile; calyx and hypanthium 2-2.5 mm. long, the calyx strigillose outside, pilose within, the lobes linear, triangular, or oblanceolate, equaling or shorter than the hypanthium; corolla 6 mm. long, white, the throat naked, the rounded lobes about half as long as the tube; fruit globose, greenish white, 8-12 mm. in diameter, smooth, glabrous, with thin pericarp and few seeds.

The shrub is abundant on the dry rocky hills about Santa Rosa and in other nearby localities in Baja Verapaz.

Randia gentlei Lundell, Wrightia 4: 125. 1969. *Wild calabash*.

In wet thickets or forest, Petén; Alta Verapaz. British Honduras. The type from British Honduras, *Gentle* 7343.

Small unarmed trees or shrubs, the thick branchlets hirsute at first; leaves short petiolate, clustered at the ends of branches, ovate-elliptic or oblanceolate, 20-45 cm. long and 5.5-13.5 (-20) cm. broad, acuminate, sparsely hirsute above, short pilose below, lateral nerves 10-12 pairs; flowers clustered at the ends of branches, subsessile; hypanthium and calyx strigose, the lobes 5-6, filiform, 1-2.5 cm. long, strigose-hirsute; corolla 4.5-8.5 cm. long, strigose-hirsute, the tube 4-4.5 cm. long, the lobes lanceolate, acuminate, to 4 cm. long; fruits globose or ellipsoid, up to 8 cm. long, and 6.5 cm. in diameter when immature.

We have seen no specimens of this species. The description is taken from the original. See also *R. monantha*.

Randia guatemalensis Standl. Contr. U. S. Nat. Herb. 20: 202. 1919.

Type collected near Secanquím, Alta Verapaz, 550 m. *Pittier* 271.

Branches ferruginous, the branchlets densely puberulent when young, bearing at the apex 2 stout spines 4-8 mm. long, the leaves fasciculate in the axils or on short spurs; stipules ovate-deltoid, 1-1.5 mm. long, mucronate; petioles 11 mm. long or less, the blades oblong-elliptic or broadly obovate sometimes broadly ovate or suborbicular, 5.5 cm. long and 3 cm. broad or smaller, obtuse or acutish, often mucronate, rounded to attenuate at the base, subcoriaceous, lustrous above, puberulent along the costa, minutely pilose beneath along the costa, the lateral nerves 5-8 on each side; flowers perfect, solitary, sessile; calyx and hypanthium 1.5 mm. long, scaberulous, the calyx lobes minute, triangular-subulate; corolla 4-5 mm. long, glabrous outside, acuminate in bud, the throat densely white-barbate, the lobes broadly ovate, apiculate, shorter than the tube.

It is doubtful whether this is distinct from *R. aculeata*.

Randia habrophlebia Standl. & Steyerl. Field Mus. Bot. 23: 25. 1943.

Type collected along the river near Jutiapa, Jutiapa, 850 m., *Standley 76321*; also in Huehuetenango (region of Santa Ana Huista, 900 m.). Mexico (Chiapas).

A dense shrub 2-3 m. high or a small tree, sometimes 6 m. high, with stout branchlets, the leaves mostly crowded at the ends of the branches; spines very few and small on the type specimens but normally doubtless well developed and in four's at the ends of branches; stipules glumaceous, brown, strigose outside, densely long-sericeous within; leaves short-petiolate, herbaceous, on petioles 6-15 mm. long, suborbicular to rounded-ovate or broadly elliptic, 6.5-9.5 cm. long, 5.5-7.5 cm. broad, broadly rounded to obtuse at the apex, at the base broadly rounded or obtuse, very densely velutinous-pilose above, more or less bullate, the nerves and veins impressed, grayish or ochraceous beneath and densely tomentose with matted hairs, the lateral nerves about 9 on each side, ascending at a very narrow angle, all the veins and nerves very prominent and reticulate; fruit terminal, solitary, sessile, globose, 3.5 cm. in diameter, almost smooth, densely pilose with subappressed hairs; seeds very numerous.

Randia letreroana Lundell, *Wrightia* 4: 126. 1969.

The type from near Letrero, Siltepec, Chiapas, alt. 2,000 m., *Matuda 4358*. Not known in Guatemala but to be expected.

Small trees, the branchlets with small paired spines; leaves drying blackish, obovate or obovate-elliptic, rounded at the apex and cuneate to the base, densely and shortly pilose on both surfaces, 1-4.5 cm. long and 0.8-2.4 cm. broad; inflorescence a 1-few-flowered axillary or terminal fascicle on the short shoots; calyx lobes linear-subulate, to 3 mm. long, ciliate; corolla 12-20 mm. long, the tube very narrow, the lobes lanceolate-elliptic, mostly less than 10 mm. long.

A highland species distinguished by the pilose leaves from those known or expected in Guatemala.

Randia lundelliana Standl. in Lundell, Contr. Univ. Mich. Herb. 4: 30. 1940.

Petén (La Libertad). British Honduras, the type from Vaca, El Cayo District.

A shrub or small tree, the trunk as much as 7.5 cm. in diameter, the branchlets densely hirsute with long, spreading brownish hairs, bearing at the apex 4 stout brown spines; stipules triangular-ovate, brown, 7-10 mm. long, attenuate-acuminate, strigose outside; leaves short-petiolate, herbaceous, broadly ovate to oblong-ovate or elliptic-obovate, 3-9 cm. long, 1.5-3.5 cm. broad, acute or acuminate, rounded to acute at the base, densely puberulent and short-hirsute above, densely hirsute beneath with straight, appressed or somewhat spreading, pale hairs, the lateral nerves about 6 pairs; flowers unisexual, the staminate ones densely aggregate at the ends of the branches, sessile; hypanthium 4 mm. long, hirsute with subappressed hairs; calyx lobes 6-7 mm. long or longer, filiform-attenuate from a lance-ovate base; corolla white, densely sericeous outside with long white hairs, the tube about 1.5 cm. long, slightly dilated in the throat, the lobes lanceolate, 1-1.5 cm. long, narrowly long-attenuate, glabrous within; fruit globose, smooth, densely pubescent, 3.5 cm. in diameter.

This plant has been identified incorrectly with *R. watsonii* Rob. and with *R. albonervia* Brandege, and has been reported under the latter name from Petén. Both those species are Mexican, and unknown from Central America. It was suspected by the senior author that *R. lundelliana* could not be maintained as distinct from *R. monantha*. Material of both species is inadequate, but it seems possible now that *R. monantha* and *R. lundelliana* are sibling species, the first from the Pacific side of Central America and Mexico, the second from the Atlantic side.

Randia monantha Benth. Pl. Hartw. 84. 1841. *Basanacantha monantha* Hook. f. ex Hemsl. Biol. Cent.-Am. Bot. 2: 39. 1881. *Es-pino*; *naranjillo* (Santa Rosa); *Jujute* (Jutiapa).

Dry or wet thickets, on slopes or along streams, 1,200 m. or lower; Petén (?); Alta Verapaz; Izabal; Chiquimula; Jutiapa; Santa Rosa (type from Río de los Esclavos, probably at the old bridge near Cuilapa, *Hartweg* 582); Escuintla; Sacatepéquez (near Las Lajas). Reported from Veracruz.

A shrub or small tree 3-6 m. high, the thick branchlets usually bearing at the apex 4 stout spines 1-2 cm. long; stipules glumaceous, broad, acuminate, brown, sericeous within; leaves clustered at the ends of the branchlets, membranaceous, on slender petioles 2 cm. long or less, obovate to ovate or elliptic, 6-17 cm. long, 3-9.5 cm. broad, short-acuminate or obtuse and mucronate at the apex, acute at the base or abruptly contracted and decurrent, short-hispidulous above or sometimes pilose with long stiff hairs, short-pilose or hispidulous beneath, the hairs mostly appressed; flowers unisexual, terminal, sessile, solitary or clustered; hypanthium short-pilose; calyx lobes subequal, linear or linear-cuneiform, 6 mm. long, acute; corolla densely villous outside with long white subappressed hairs, the tube 4-5 cm. long, slender, slightly dilated above, the lobes ovate-oblong to linear-lanceolate, 2.5-3.5 cm. long,

acuminate or long-attenuate; fruit globose, 3.5-4 cm. in diameter, obscurely costate, the shell very thick and hard, cream-colored when fresh but drying blackish, containing very numerous seeds.

The Central American species of this alliance are poorly understood because of the lack of ample flowering specimens. See account of *R. lundelliana*. The material of this species is inadequate—some probably does not belong here.

Randia pleiomeris Standl. Contr. U. S. Nat. Herb. 20: 202. 1919.

Collected at Santa Rosa, Dept. Santa Rosa, 900 m., *Heyde & Lux 3166*. Possibly in El Salvador.

Branches slender, brownish, strigose when young, the spines in pairs along the branches, stout, ascending, 1-1.5 cm. long, the leaves crowded on short lateral spurs; stipules ovate-deltoid, 2 mm. long, pilose within at the base; petioles slender, 4-8 mm. long; leaf blades cuneate-orbicular or broadly obovate, 8-18 mm. long, 7-13 mm. broad, cuneate or abruptly decurrent at the base, rounded or truncate at the apex, membranaceous, glabrous above, sparsely appressed-pilose beneath along the costa; flowers solitary, terminal, sessile; hypanthium 2.5 mm. long, appressed-pilose; calyx glabrous, 2 mm. long, the lobes usually 7, linear, 4 mm. long, sparsely ciliate; corolla salverform, glabrous outside, the slender tube 2.5 cm. long, the 5 lobes ovate or ovate-oblong, 1 cm. long, glabrous within, the throat naked; anthers subexserted.

Apparently a rare species, not represented in recent Guatemalan collections. Even in the sterile state the species should be recognizable because of its distinctive leaves. This species was distributed by Captain Smith as *R. xalapensis* Mart. & Gal.

Randia standleyana L. Wms. Phytologia 24: 162, *fig.* 1972. Figure 28.

Sparse forests or clearings, altitude about 200 m., endemic and known only from near La Libertad, Petén (type, *Lundell 3474*).

Shrubs or perhaps small trees of unknown size; the branchlets opposite, mostly about 4-5 cm. long and terminated by a pair of spines 6-10 mm. long, sparsely pilose or glabrescent; the leaves usually 4 on very short opposite short-shoots, sessile or nearly so, obscurely puberulent on both surfaces, the blades obovate to broadly obovate, obtuse, attenuate to the base, *mostly* 7-15 mm. long and 3-10 mm. broad; inflorescence a sessile 1-few-flowered fascicle terminal on short shoots; flowers very small, mostly 4-5 mm. long; ovary densely white pubescent; calyx campanulate, 5-lobate, glabrous, about 1-1.5 mm. long, the lobes lanceolate, acute, ciliate, to 0.8 mm. long; corolla salverform, 3-4 mm. long, 5-lobate, glabrous outside, sparsely pubescent in the throat, the tube 2-2.5 mm. long, lobes spreading, ovate or suborbicular, obtuse, 1.5-2 mm. long; stamens nearly sessile in the throat of corolla; style as long as the corolla tube, the stigma bifid; fruit not known.

The species most closely related is *R. cookii* Standl., possibly a sibling species from the Pacific side of Guatemala and Chiapas.

EXCLUDED OR NOT PLACED

Randia longiloba Hemsl. Biol. Cent.-Am. Bot. 4: 101. 1887.

Dry xerophytic forests of the northern tip of the Yucatan Peninsula; reported by Lundell (*Wrightia* 4: 126. 1969) from Petén. We have seen no specimens of this species from the Petén.

Randia petenensis Lundell, *Wrightia* 4: 127. 1969.

Wet thickets or forests, known only from Petén, type *Contreras* 6941.

Trees to about 12 m. tall and 0.15 m. in diameter. Branchlets slender, with or without spines and when present in pairs along the branches; stipules broadly ovate, subulate, about 6 mm. long; the short petiolate leaves up to 14.5 cm. long and 8.5 cm. broad, ovate or ovate-elliptic, acuminate, the base narrowed and decurrent, secondary nerves 5 or 6 pairs; fruits clustered on older wood, sessile, glabrous, globose and up to 1 cm. in diameter, the persistent hypanthium about 1 mm. high.

Flowers are not known and the relationship of the species is uncertain.

RELBUNIAM (Endl.) Benthams & Hooker

Reference: F. Ehrendorfer, Revision of the Genus *Relbunium*, Bot. Jahrb. 76: 516-553. 1955.

Plants usually herbaceous and perennial, in habit like *Galium*; leaves mostly in whorls of 4, membranaceous or coriaceous; flowers perfect, axillary, solitary, pedicellate, the pedicels articulate with the flower, the flowers surrounded by an involucre of usually 4 bracts; hypanthium globose, the calyx obsolete; corolla rotate, the 4 lobes valvate in bud; stamens 4, inserted in the corolla tube, the filaments short, the anthers didymous, exserted; ovary 2-celled, the 2 styles short, free or connate at the base, the stigmas capitate; ovules solitary, affixed to the septum; fruit didymous, coriaceous or fleshy, smooth or granulate, 2-seeded.

About 30 species, ranging from the southwestern United States to the southern extremity of South America. Distinguished readily from *Galium* by the involucre flowers. No other species are known from Central America.

Fruits pilose; stems abundantly pilose.....	<i>R. hypocarpium</i> .
Fruits and stems glabrous.....	<i>R. microphyllum</i> .

Relbunium hypocarpium (L.) Hemsl. Biol. Cent. Am. Bot. 2: 63. 1881. *Vaillantia hypocarpia* L. Syst. Nat. ed. 10. 1307. 1759. *Rubia hypocarpia* DC. Prodr. 4: 591. 1830. *Hierba peluda* (fide Aguilar). Figure 67.

Common and widely distributed at middle and higher elevations, 1,200-3,000 m., wet or moist forest or thickets, more often on open banks or cliffs, sometimes in oak-pine forests; Alta Verapaz; Zacapa; Chiquimula; Jalapa; Santa Rosa; Guatemala; Sacatepéquez; Quiché; Huehuetenango; Quezaltenango; San Marcos. Southern Mexico to Panama, southward through the cooler regions of South America.

A slender prostrate perennial, or procumbent or occasionally scandent over low bushes, sometimes pendent from moist banks and cliffs, the stems pilose; leaves oblong-elliptic to obovate, 5-15 mm. long, 3-8 mm. broad, rounded and usually mucronate at the apex, membranaceous or becoming thick, deep green and often somewhat lustrous above, pilose on both surfaces, slightly narrowed at the base; pedicels 5-15 mm. long, the bracts ovate to oblong, acute or acutish, narrowed to a subpetiolar base; the flowers sessile within the bracts; corolla minute, white, its lobes ovate, ciliate, acutish; fruit orange-red, 2-3 mm. long, sparsely pilose.

A very common plant in many places in the mountains, its abundant orange fruits sometimes rather conspicuous.

Relbunium microphyllum (Gray) Hemsl. Biol. Cent. Am. Bot. 2: 63. 1881. *Galium microphyllum* Gray, Pl. Wright. 1: 80. 1852. *Rubia laevigata* DC. Prodr. 4: 591. 1830. *Relbunium laevigatum* Hemsl. l.c.

Open forest or subalpine meadows on open banks, 2,000 m. or more, rare and local; Chimaltenango; Quezaltenango; Huehuetenango. Ranging northward to the southwestern United States.

A glabrous perennial, usually much branched from the base, the very slender but rather stiff stems 30 cm. long or less, usually procumbent, the stems obtusely tetragonous; leaves stiff, 5-15 mm. long, pungent-tipped, the margins thickened, revolute, smooth; pedicels about as long as the leaves, the bracts similar to the leaves but smaller, the flowers sessile; corolla greenish, the lobes ovate, subobtusely; fruits glabrous, sometimes slightly granulose, about 3 mm. long.

RICHARDIA Linnaeus

Annual or perennial herbs, erect or prostrate, usually villous or hispid, the stems terete; stipules united with the petioles to form a multisetose sheath; leaves opposite, sessile or petiolate; flowers small, white or pink, arranged in dense heads, these chiefly terminal and subtended by large leaflike bracts; hypanthium turbinate or subglobose, the calyx 4-8-lobate, the lobes lanceolate or subulate, persistent; corolla

funnelform, glabrous in the throat, the limb 3-5-lobate, the lobes ovate or lanceolate, valvate in bud; stamens 3-5, inserted in the corolla throat, with filiform filaments; anthers dorsifixed near the base, linear or oblong, exerted; ovary 3-4-celled, the style filiform, with 3-4 linear or spatulate branches; ovules solitary, affixed to the middle of the septum; capsule 3-4-coccous, the apex of the capsule circumscissile, the cocci membranaceous or crustaceous, muricate or papillose, rarely smooth, indehiscent, the axis sometimes persistent; seeds elliptic-oblong, bisulcate ventrally.

A genus of 10 species or more, in the warmer parts of America, chiefly in Brazil. Only one species is found in Central America.

Richardia scabra L. Sp. Pl. 330. 1753. *Richardsonia scabra* St. Hill. Pl. Usu. t. 8. 1824. *Golondrina blanca* (Guatemala); *ipeca* (fide Aguilar). Figure 59.

A common weed throughout the warmer parts of Guatemala, especially in the plains of both coasts, ascending commonly in settled regions to 1,500 m. or more, or in some areas to 2,000 m., and on the Volcán de Pacaya to 2,500 m.; often a weed in cornfields, also in waste ground generally or in pastures or thickets; Petén; Alta Verapaz; Izabal; Sacatepéquez; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Escuintla; Guatemala; Chimaltenango; Suchitepéquez; Quezaltenango; Huehuetenango; Quiché. Widely distributed in most warmer parts of America; Mexico; British Honduras to El Salvador and Panama; south to Peru and Argentina.

Annual, usually prostrate and forming mats, sometimes erect, pilose or hispid throughout; leaves petiolate, herbaceous, oblong or lanceolate to oblong-ovate, 2-9 cm. long, acute and mucronate, narrowed at the base, conspicuously nerved; inflorescence capitate, with few or many flowers, usually long-pedunculate, subtended by 2 large, broadly ovate bracts similar to the leaves; sepals lanceolate, green; corolla white, 4-6 mm. long, glabrous outside; carpels 3, densely muriculate dorsally, sulcate on the inner face, 2-3 mm. long.

A common weed of general distribution in most parts of Central America.

RONDELETIA Linnaeus

Reference: Paul C. Standley, N. A. Fl. 32: 44-86. 1918.

Shrubs or trees, usually pubescent, with terete or angulate branchlets; stipules interpetiolar, usually broad and sometimes foliaceous, obtuse to cuspidate, usually persistent; leaves opposite or verticillate, sessile or petiolate, membranaceous or coriaceous; inflorescence terminal or axillary, usually cymose or paniculate; hypanthium commonly subglobose, the calyx 4-5-lobate, the lobes narrow or broad, often unequal, persistent; corolla funnelform or salverform, white, yellowish, pink, or red, the tube usually slender and elongate, often ampliate in the throat, the throat often annular-thickened, sometimes barbate, the 4-5 lobes spreading, broad, obtuse,

imbricate in bud, 1 or 2 of them exterior; stamens 4-5, inserted in the corolla throat, included or exerted, with short filaments; anthers dorsifixed, narrowly oblong or broader, obtuse, erect; ovary 2-celled, the style filiform, obtuse or short-bifid; ovules numerous, the placentae affixed to the septum; capsule usually small and globose, chartaceous or coriaceous, 2-celled, loculicidally or septicidally bivalvate, the valves commonly biparted; seeds minute, compressed or angulate, often winged or appendaged, with thin testa.

A large genus in tropical America, about 150 species being known from North America, and many others in South America. Numerous other species are found in the mountains of southern Central America, and a great many are native in Mexico.

The genus *Rondeletia* is a fascinating and common one in the highlands of Guatemala. A few species are rather widely distributed but 23 of the 31 species recognized in Guatemala, adjacent British Honduras, and the border region in Chiapas, Mexico, are mostly local endemics. These are often abundant in their restricted areas. We must recognize, of course, that Guatemala and the adjacent regions are still inadequately known and collected.

Dr. Julian A. Steyermark in his study of the Rubiaceae in Mem. N. Y. Bot. Gard. 17: 241-261. 1967 has separated *Arachnothrix* Planchon out of *Rondeletia* and has given reasons, in a key, for doing this. Several of the species in this flora and, in fact, perhaps most of them would need to be transferred to *Arachnothrix* if the separation were followed.

Corolla densely yellow-barbate in the throat; stipules usually foliaceous and reflexed; flowers 5-parted.

Corolla glabrous outside.....*R. suffrutescens*.

Corolla variously pubescent outside.

Branches sharply quadrangular; leaves usually acute at the base..*R. stenosiphon*.

Branches terete or nearly so; leaves subcordate to obtuse at the base.

Leaves ternate; inflorescence umbellate or subcapitate at the ends of the branches.....*R. strigosa*.

Leaves opposite; inflorescence cymose-paniculate.

Calyx lobes linear-subulate, attenuate.....*R. ehrenbergii*.

Calyx lobes deltoid to oblong, obtuse or acutish.

Stipules subulate-deltoid from a broad base.....*R. seleriana*.

Stipules mostly oblong and foliaceous, 1 cm. long or longer, usually obtuse.

Leaves densely soft-pilose beneath.....*R. amoena*.

Leaves glabrous beneath or sparsely strigose.

Corolla tube 8-10 mm. long.....*R. cordata*.

Corolla tube about 4 mm. long.....*R. brachistantha*.

Corolla usually naked in the throat, never yellow-barbate; stipules mostly narrow and erect.

Inflorescence an elongate narrow spike-like panicle.

Corolla arachnoid-tomentose outside, sometimes only sparsely so.

Leaves in age glabrous or glabrate, or at least never white-tomentose, sometimes somewhat tomentose beneath when young.

Lobes of the calyx longer than the hypanthium.....*R. septicidalis*.

Lobes of the calyx shorter than the hypanthium.

Leaves tomentose beneath with loose or dense tomentum.

Corolla tube about 10 mm. long; tomentum of leaves loose and coarse.

R. skutchii.

Corolla tube about 7 mm. long; tomentum of leaves tight and fine.

R. myriantha var. *armentalis*.

Leaves glabrate at least in age or with sparse closely appressed arachnoid tomentum of very slender hairs; corolla tube less than 8 mm. long.

Stipules triangular or triangular-ovate; inflorescence narrow and to 2 cm. broad or less.

Petioles of a pair of leaves unequal, one usually much longer than 2 cm.; lowland forest species*R. silvicola*.

Petioles of a pair of leaves subequal, mostly 1 cm. long or less; species of wet highland forest.....*R. gracilis*.

Stipules narrowly linear-lanceolate; inflorescence mostly 2-4 cm. broad; montane species.....*R. rubens*.

Leaves, even in age, covered beneath with a very dense and close, white tomentum.

Corolla tube 5-8 mm. long.....*R. buddleioides*.

Corolla tube 12-15 mm. long.....*R. laniflora*.

Corolla variously pubescent outside but never tomentose.

Calyx lobes about 7 mm. long.....*R. tacanensis*.

Calyx lobes very small, rarely 2 mm. long.

Pubescence of the lower leaf surface of dense, spreading, usually rufous hairs*R. rufescens*.

Pubescence of the lower leaf surface of closely appressed hairs.

Corolla tube glabrous except near the apex, there setose-pilose; leaves thinly sericeous beneath with very long and slender hairs

R. stachyodea.

Corolla tube pubescent throughout; leaves variously pubescent beneath but not as above.

Hypanthium and capsule hispidulous with spreading hairs; leaves strigose on the upper surface*R. secundiflora*.

Hypanthium and calyx tomentulose or strigose with appressed hairs; leaves not strigose on the upper surface, usually glabrous.

Calyx lobes very unequal, one of them larger and foliaceous; leaves sericeous beneath when young.....*R. pansamalana*.

Calyx lobes subequal; leaves arachnoid-tomentose to tomentose beneath, at least when young.....*R. myriantha* & var. *armentalis*.

Inflorescence various but never an elongate narrow spike-like panicle.

Corolla glabrous outside.....*R. jurgensenii*.

Corolla sparsely or densely pubescent outside.

Calyx lobes, at least some of them, 4-10 mm. long or longer.

Leaves obtuse or narrowly rounded at the apex, glabrous or nearly so.

R. chinajensis.

Leaves acute or acuminate, densely pubescent or almost glabrous.

Leaves glabrous or nearly so; larger calyx lobes obtuse or rounded at the apex.

Leaf blades oval, 4-6 cm. broad; smaller calyx lobes elliptic.

R. aetheocalymna.

Leaf blades lance-oblong, about 2 cm. broad; smaller calyx lobes linear.

R. cordovana.

Leaves sparsely or densely pubescent on both surfaces; larger calyx lobes acuminate or attenuate.

Hypanthium appressed-pilose; calyx lobes 10 mm. long or shorter; corolla tube 5-7 mm. long.....*R. zolleriana*.

Hypanthium hirsute with long spreading hairs; calyx lobes about 15 mm. long; corolla tube about 15 mm. long.....*R. macrocalyx*.

Calyx lobes small, 3 mm. long or shorter.

Inflorescences small, mostly 3-5-flowered; corolla very sparsely pubescent outside.....*R. deamii*.

Inflorescence many-flowered, often large.

Stipules triangular, acuminate, about 2 mm. long.....*R. belizensis*.

Stipules oblong-spatulate, rounded-ovate or orbicular, mostly 8-15 mm. long or even larger.

Stipules erect, oblong-spatulate, scarcely foliaceous.....*R. linguiformis*.

Stipules reflexed, orbicular or nearly so, foliaceous.....*R. izabalensis*.

Rondeletia aetheocalymna Donn.-Sm. Bot. Gaz. 42: 298. 1906.

Alta Verapaz, the type collected between Sepacuité and Secanquím, 550-990 m., *Maxon & Hay 3275*; known only from the original collection.

A shrub 3 m. high, the branchlets sparsely strigillose or almost glabrous; stipules narrowly oblong or spatulate-oblong, 8-10 mm. long, erect, obtuse or acute; leaves opposite, on stout petioles 7-15 mm. long, glabrous, oval or oval-obovate, 9-15 cm. long, 4-6.5 cm. broad, abruptly acute or acuminate, acute to abruptly attenuate at the base, glabrous, dark green and lustrous above; inflorescences terminal or partly axillary, cymose-corymbose, long-pedunculate, the flowers subsessile or on stout pedicels 1 cm. long or shorter, the corymbs 5-10 cm. long and broad; bracts oblong or linear-oblong, foliaceous, 5-12 mm. long; hypanthium densely sericeous; calyx lobes 4, very unequal, 3 of them elliptic, acute, 2-3 mm. long, the fourth oval or elliptic, 5-8 mm. long, obtuse or rounded at the apex, green; corolla white, sericeous outside, the stout tube 7-8 mm. long, the throat naked, the 4 lobes rounded, spreading; anthers and style included; capsule globose, 5-7 mm. in diameter, sericeous; seeds angulate, brown, punctate.

Rondeletia amoena (Planch.) Hemsl. Diag. Pl. Mex. 26. 1879. *Rogiera amoena* Planch. Fl. Serres 5: 442. 1849. *Rogiera menechma* Planch. l.c. *Rondeletia versicolor* Hook. Bot. Mag. 77: t. 4579. 1851. *Rogiera versicolor* Lindl. & Paxt. Fl. Gard. 2: 69, f. 154. 1851.

Rogiera latifolia Decaisne, Rev. Hort. IV. 2: 121, t. 7. 1853.
Pachatapal (fide Aguilar); *xk'ac* (Todos Santos, fide Seler).

Described from plants grown in Belgium from Guatemalan seeds. Damp or wet forest or thickets, 1,200-2,250 m.; Alta Verapaz; El Progreso; Chiquimula (Cerro Brujo); Santa Rosa (near Oratorio); Guatemala; Quiché; Huehuetenango; Quezaltenango. Mexico (Oaxaca) to Panama.

A shrub or small tree 1.5-9 m. high, the branches terete, densely villous-pilose when young; stipules triangular-oblong, 10-15 mm. long, reflexed, obtuse; leaves opposite, the stout petioles 2-10 mm. long, the blades ovate to oblong-ovate, 6-15 cm. long, 3.5-7 cm. broad, usually abruptly short-acuminate, at the base rounded or subcordate, glabrous or thinly pilose above, densely and softly short-pilose beneath, petioles 5-8 mm. long, pilose; inflorescences terminal and axillary, cymose-corymbose, 5-18 cm. broad, stout-pedunculate, the cymes densely many-flowered, the flowers sessile or short-pedicellate; bracts often large and foliaceous; hypanthium densely fulvous-pilose, the calyx lobes 4-6, nearly unequal, oblong or obovate-oblong, 1-2 mm. long, obtuse, erect or spreading; corolla pink, densely appressed-pilose, the stout tube about 5 mm. long, the throat densely yellow-hirsute, the 5 lobes rounded, 2-2.5 mm. long, puberulent within; capsule globose, 5-6 mm. in diameter, densely pilose.

A handsome shrub because of the abundant pink flowers. It was formerly a favorite in northern hothouses, and still is grown occasionally. The description is based on Guatemalan material.

Rondeletia belizensis Standl. Carnegie Inst. Wash. Publ. 461: 91. 1935. *Bacce* (Petén, Maya, fide Lundell).

Petén. British Honduras, the type collected on Jacinto Hills, 90 m., *Schipp* 1201.

A shrub or tree as much as 6 m. tall, the branches terete, the branchlets puberulent when young; stipules narrowly triangular, 1.5-2 mm. long; leaves on petioles 5-8 mm. long, the blades ovate or oblong-ovate, 3-7 cm. long, 1.5-4.5 cm. broad, acute or subobtusely, obtuse or acute at the base, glabrous; inflorescence terminal, cymose-corymbose, densely many-flowered, pedunculate or sessile, as much as 5 cm. long but often much smaller and headlike, the small bracts linear, the pedicels 2 mm. long or less; hypanthium densely whitish-puberulent, the 4 sepals linear, erect, 1.5-2 mm. long, obtuse; corolla white, densely covered outside with minute whitish ascending hairs, the slender tube 7-9 mm. long, glabrous in the throat, the 4 lobes broadly rounded, 2 mm. long, villosulous within; capsule subglobose, 6 mm. broad, scaberulous-puberulent; seeds broadly winged.

Rondeletia brachistantha Standl. & Steyerl. Field Mus. Bot. 23: 25. 1943.

San Marcos, the type collected on dry upper slopes, Volcán de Tacaná, near San Rafael and the Mexican boundary, 2,500-3,000 m., *Steyermark* 36286. Mexico (Chiapas).

A tree, the branchlets terete, appressed-pilose when young; stipules 14 mm. long, reflexed, oblong-deltoid, brown, obtuse, glabrous within, strigose outside; leaves subcoriaceous, on stout petioles 4 mm. long or less, ovate to oblong-ovate or elliptic-oblong, 5-8 cm. long, 2.5-3.5 cm. broad, acute or subacuminate, rounded or narrowly rounded at the base, glabrous or sparsely hirtellous beneath along the nerves, the lateral nerves about 5 on each side; inflorescence terminal, cymose-corymbose, densely many-flowered, on a peduncle 2-5 cm. long, 3-6 cm. long, 4-9.5 cm. broad, the branches densely yellowish-strigose, the bracts minute, the flowers sessile or subsessile; hypanthium globose, 1.5 mm. high, densely appressed-hispidulous and at first tomentose, the calyx 0.7 mm. high; the teeth minute, remote, obtuse; corolla pale pink, densely and minutely strigillose, the tube 4-5 mm. long, densely yellow-barbate in the throat, the lobes rounded, 1.5 mm. long, puberulent within; style exerted; capsule globose, 4-4.5 mm. broad, rounded at the base, glabrate, loculicidally dehiscent; seeds compressed, dark brown, punctulate.

Rondeletia buddleioides Benth. Pl. Hartweg. 69. 1840. *R. affinis* Hemsl. Diag. Pl. Mex. 28. 1879. *Durazno* (Quezaltenango). Figure 5.

Wet mixed forest or in limestone thickets, 350-1,800 m.; Alta Verapaz; Quiché; Huehuetenango; Quezaltenango; San Marcos. Southern Mexico and British Honduras to Nicaragua and possibly to Costa Rica and Panama.

A shrub or a small tree 1.5-9 m. tall, the branches subterete, dark brownish, densely floccose-tomentose when young but soon glabrate; stipules lanceolate or oblong, 3-8 mm. long, obtuse to attenuate, erect; leaves opposite, on petioles 3-6 mm. long or longer, the blades oval-elliptic to elliptic-oblong or lanceolate, 5-12 cm. long and 2-5.5 cm. broad or larger, acute to long-attenuate, at the base obtuse to long-acuminate, green above and sparsely pilose or usually glabrous, beneath densely covered with a very close, white cobwebby tomentum; inflorescence terminal, the flowers sessile or subsessile in small dense short-pedunculate cymes, these arranged in narrow spikelike panicles 10-15 cm. long, the bractlets linear, very small; hypanthium densely white-tomentose, the calyx lobes oblong or oval, obtuse, 1 mm. long or less, spreading or reflexed, glabrous within; corolla variously described as yellowish, white, or dark red, usually densely white-tomentose outside, the slender tube 4-8 mm. long, naked in the throat, the rounded lobes 1-1.5 mm. long; capsule oblong-globose, 3-4 mm. long, glabrate; seeds minute, reticulate-punctulate.

We presume that several species have gone under this name at one time or another, these distributed from Mexico to Panama. There are apparent differences between the material found from Mexico to Nicaragua and that of Costa Rica and Panama. Careful study may indicate a difference, or that it is all a somewhat variable species.

Rondeletia chinajensis Standl. & Steyerl. Field Mus. Bot. 23: 254. 1947.

Known only from the type, Alta Verapaz, on knife edge of limestone ridge, Cerro Chinajá, between Finca Yalpemech and Chinajá, 150-700 m., *Steyermark* 45637.

A small tree of 6-9 m., the branches subterete, slender, minutely puberulent; stipules deltoid, appressed, puberulent, 1.5 mm. long, acute or subobtusate; leaves on petioles 8-12 mm. long, coriaceous, somewhat lustrous, elliptic-oblong or rarely oblong or oval-ovate, 3.5-6.5 cm. long, 1.8-3 cm. broad, obtuse or narrowly rounded at the apex, obtuse or subacute at the base, glabrous above, brownish beneath when dried, sometimes short-barbate in the axils of the nerves, otherwise glabrous or glabrate; inflorescences terminal, sessile or short-pedunculate, cymose but very dense and headlike, the flowers sessile or subsessile; hypanthium 1.5 mm. long, very densely white-pubescent; calyx lobes 5, linear or narrowly spatulate-linear, mostly 4.5-5.5 mm. long, acute or subacute, sparsely puberulent below or almost glabrous, sometimes alternating with other very short and narrow segments; corolla white, densely hispidulous outside with spreading or subappressed hairs, the tube 14-16 mm. long, the 4 lobes spreading, oval or obovate-oval, 6-8 mm. long, rather densely puberulent within, the throat not barbate; capsule globose, 4.5 mm. in diameter.

Rondeletia cordata Benth. Pl. Hartweg. 85. 1841. *Rogiera cordata* Planch. Fl. Serres 5: 442b. 1849. *R. intermedia* Hemsl. Diag. Pl. Mex. 26. 1879. *Huesillo* (Quezaltenango); *trompetal*.

Damp or rather dry, oak or mixed forest, often in thickets or on cliffs, 900-2,850 m.; Santa Rosa (Volcán de Tecuamburro); Guatemala (type collected near Guatemala, *Hartweg* 585); Sacatepéquez; Chimaltenango; Sololá; Suchitepéquez; Quiché; Quezaltenango; San Marcos. Mexico (Chiapas); El Salvador; Honduras.

A shrub 2-4 m. high or sometimes a tree of 9 m., the branches stout, terete, sparsely strigose when young; stipules oblong-triangular, 6-15 mm. long, reflexed, foliaceous, obtuse, strigose outside; leaves opposite, sessile or nearly so, the petioles 4 mm. long or less, the blades narrowly ovate-oblong to ovate or ovate-oval, 7-13 cm. long and 3-7 cm. broad or larger, acute or acuminate, at the base rounded to subcordate, subcoriaceous, glabrous above, sparsely strigose beneath along the veins or glabrous; inflorescences terminal and axillary, cymose-corymbose, 5-15 cm. broad, pedunculate, dense and many-flowered, the flowers short-pedicellate; bracts often large and foliaceous; hypanthium strigillose, the 5 calyx lobes rounded to oblong, unequal, 1 mm. long or less, obtuse, erect; corolla pink, thinly strigose outside, the stout tube 8-10 mm. long, densely yellow-barbate in the throat, the 5 lobes rounded, 2 mm. long, puberulent within; anthers and style exerted or included; capsule globose, 3-4 mm. in diameter, strigillose; seeds numerous, minute, compressed, brownish yellow.

A handsome and showy shrub, abundant in many parts of the central highlands and in flower at the beginning of the dry season in December and January. The species is closely related to *R. amoena*.

Rondeletia cordovana Standl. & Steyerl. Field Mus. Bot. 23: 26. 1943.

Type from cloud forest in ravine bordering Quebrada Alejandría, summit of Sierra de las Minas, vicinity of Finca Alejandría, Zacapa, 2,500 m., *Steyermark* 29906.

A small, almost glabrous tree with slender terete ferruginous branchlets; stipules subulate from a triangular base, about 3 mm. long, erect; leaves small, membranaceous, on slender petioles 5-10 mm. long, lance-oblong, 5.5-7.5 cm. long, 1.7-2.5 cm. broad, with a very long and narrow, attenuate acumen, glabrous above or nearly so, much paler beneath, barbate in the axils of the nerves, elsewhere glabrous, the lateral nerves inconspicuous, about 6 on each side; inflorescence terminal, on a peduncle 1.5 cm. long, erect, cymose-corymbose, few-flowered, trichotomous at the base, about 3 cm. high and 4.5 cm. broad, the flowers densely cymose-aggregate at the apices of the primary branches, sessile or short-pedicellate, the lowest bracts similar to the leaves but smaller; hypanthium obovoid, 1.5-2 mm. long, densely and minutely strigillose; calyx 4-lobate, the lobes very unequal, 3 of them linear or linear-subulate, 3 mm. long, the fourth lance-oblong, 5-6 mm. long, obtuse, glabrate; corolla in bud broadly rounded at the apex, densely and minutely strigillose outside.

The type is a poorly developed specimen, without open corollas, but the species represented appears to be fully distinct from *R. aetheocalymna*, its nearest ally. It is dedicated to the late Alejandro Córdova, distinguished journalist of Guatemala and proprietor of the Finca Alejandría, where the type was collected.

Rondeletia deamii (Donn.-Sm.) Standl. N. Am. Fl. 32: 60. 1918. *Bouvardia deamii* Donn.-Sm. Bot. Gaz. 49: 455. 1910.

Type collected at base of a cliff near Fiscal, Guatemala, 1,110 m., *Deam* 6190. Usually in dry rocky thickets or along rocky stream banks, 300-1,400 m.; Chiquimula; Guatemala; Quiché; doubtless also in Baja Verapaz. El Salvador; Honduras.

A shrub or small tree, usually 1-2 m. high but sometimes as much as 6 m., the branches terete, reddish brown or grayish, sparsely short-pilose when young; stipules deltoid, acute, 1 mm. long, erect; leaves opposite, on petioles 1-2 mm. long, ovate-orbicular or ovate, 3-6.5 cm. long, 1.5-2.5 cm. broad, abruptly acuminate or attenuate, at the base broadly rounded to acute, glabrous above or very minutely and sparsely pilose, minutely pilose beneath, especially along the veins; flowers mostly in terminal 3-flowered cymes, these sessile or slender-pedunculate, the slender pedicels 8 mm. long or less, solitary long-pedicellate flowers sometimes present in the upper leaf axils; hypanthium minutely pilose, the 4 calyx lobes linear, 1-2 mm. long, one of them usually foliaceous, linear or linear-elliptic, and up to 4 mm. long, acute or obtuse, erect or spreading; corolla (color not recorded) sparsely short-pilose, the slender tube 7-12 mm. long, naked in the throat, the 4 lobes rounded-oblong, 3 mm. long, minutely papillose within; anthers and style included or the anthers partly exerted; capsule subglobose, about 5 mm. broad, glabrate; seeds dark brown, somewhat compressed, rather broadly and irregularly winged.

The plant grows abundantly in the rocky ravines in the low hills just northeast of Fiscal, which is presumably the original locality.

Rondeletia ehrenbergii Schum. ex Standl. N. Am. Fl. 32: 50. 1918.

Type from Totonicapán, *Ehrenberg 1033*.

A shrub with terete grayish-brown branches, these densely fulvous-puberulent or strigillose when young; stipules narrowly triangular, 5-8 mm. long, attenuate, erect; leaves opposite, on petioles 3-5 mm. long, oval or ovate-oval, 3-5 cm. long, 1-3 cm. broad, acute to rounded at the apex, rounded or subcordate at the base, thick-coriaceous, densely strigillose above, densely short-pilose beneath; inflorescences terminal and axillary, cymose-corymbose, very dense and many-flowered, 4-5 cm. broad, the flowers short-pedicellate, the bracts elongate, linear-setaceous; hypanthium densely fulvous-strigillose, the 5 calyx lobes linear-subulate, 2.5-4 mm. long, erect; corolla densely strigillose outside, the slender tube 15 mm. long, the throat densely yellow-barbate, the 5 lobes obovate-orbicular, 4 mm. long, puberulent within; style exserted; capsule globose, 3-3.5 mm. in diameter, strigillose.

Rondeletia gracilis Hemsl. Diag. Pl. Nov. Mex. Cent.-Am. 53. 1880.

Wet highland forests at about 1,200 m.; Alta Verapaz (type, *Tuerckheim 404*). Endemic.

Slender shrubs to 3 m. tall; branches subterete, white tomentose when young but soon glabrous; stipules triangular or triangular-oblong, obtuse, about 5 mm. long; leaves opposite, somewhat anisophyllous, elliptic to oblong-lanceolate, acuminate, 8-15 cm. long and 3-6 cm. broad, almost entirely glabrous, petioles subequal, up to 1.5 cm. long; inflorescence a racemose spike about 15-20 cm. long and 2 cm. broad, sparsely tomentose; flowers numerous, red, tetramerous, in nearly sessile heads; hypanthium fulvous-tomentose, about 1 cm. long at anthesis; calyx lobes lance-oblong, acute, glabrous within, erect or reflexed, about 0.5 mm. long; corolla red or dark red, the slender tube about 7 mm. long at anthesis, thinly floccose-tomentulose, glabrous in the throat, the lobes about 1 mm. long, anthers and style included; capsule not known.

A rare species known only from the region of Cobán, Alta Verapaz. It is related to the lowland *R. silvicola* L. Wms., but is the smallest flowered of the alliance.

Rondeletia izabalensis Standl. & Steyerl. Field Mus. Bot. 22: 286. 1940.

Wet forest at or near sea level, Izabal; type collected at Escoba, across the bay from Puerto Barrios, *Standley 72891*. Endemic.

A shrub or small tree, 6 m. tall or less, the branches subterete, the young ones sparsely strigose; stipules foliaceous, subreniform, recurved, about 1 cm. long, broadly

rounded at the apex, deeply cordate at the base; leaves firm-membranaceous, on stout petioles 6-15 mm. long, oblanceolate-oblong to oblong-obovate or elliptic-lanceolate, 11-23 cm. long, 5-9.5 cm. broad, acute to long-attenuate, cuneate at the base or narrowly attenuate, the very base sometimes subobtuse, glabrous above, minutely appressed-pilose beneath, the lateral nerves about 9 on each side; inflorescence terminal, on a peduncle 7-9 cm. long, erect, cymose-corymbose, about 5 cm. long and 7 cm. broad, densely many-flowered, the basal bracts foliaceous, the upper ones linear-attenuate and 3-10 mm. long, the branches densely sericeous-strigillose, the flowers densely crowded, sessile; hypanthium 1 mm. long, densely appressed-pilose, the calyx 1 mm. long, appressed-pilose, 4-lobate, the lobes ovate, obtuse or acute, unequal; corolla white, densely pilose with subappressed hairs, the slender tube 5-6 mm. long, the throat not barbate, the 4 lobes rounded, 1.5-2 mm. long, glabrous within.

Rondeletia jurgensenii Hemsl. Diag. Pl. Mex. 29. 1879; Bullock in Hook. Icon. 34: t. 3322. 1936.

Quezaltenango, oak forest, Volcán de Santa María, at 1,500-3,000 m. Southern Mexico; El Salvador; Honduras.

A shrub or small tree 2-4.5 m. high, glabrous almost throughout, the young branchlets sometimes pilose; stipules small, deltoid, acute; leaves membranaceous, on petioles 4-6 mm. long, narrowly ovate to elliptic-lanceolate or oblanceolate, 9.5 cm. long and 3.5 cm. broad or smaller, acute or acuminate, at the base acute or cuneate, almost or quite glabrous, the margins usually ciliate; flowers pink, 4-parted, the inflorescences terminal, cymose-corymbose, lax and rather few-flowered, the pedicels 3-5 mm. long, the small bracts subulate; hypanthium 2 mm. long, pilose, the calyx lobes subulate, 2-4 mm. long, pilose, often unequal; corolla 1.5 cm. long, glabrous, the spreading lobes broadly elliptic to rounded, 2.5 mm. long; capsule glabrous, 4.5-6 mm. broad; seeds numerous, prismatic.

Rondeletia laniflora Benth. Pl. Hartweg. 85. 1841. *Arachnothryx laniflora* Planch. Fl. Serres 5: 442. 1849. *Papelillo*.

Wet mixed mountain forest, 1,400-3,000 m.; El Progreso; Zacapa; Jalapa; Guatemala (Palencia); Suchitepéquez (type from Las Nubes, *Hartweg 584*); San Marcos; Huehuetenango. Southern Mexico; El Salvador.

A shrub or small tree, 2-7.5 m. high, the branches subterete, densely and closely white-tomentose at first; stipules narrowly triangular or subulate, 3-8 mm. long, erect; leaves opposite, crowded at the ends of the branches, on stout petioles 4-10 mm. long, obovate to narrowly lance-elliptic, 6-13 cm. long, 1-4 cm. broad, or sometimes larger, long-attenuate or abruptly acuminate, at the base cuneate to attenuate, subcoriaceous, dark green and glabrous above or when young thinly floccose-tomentulose, white beneath and covered with a very dense and close tomentum; inflorescence terminal, the flowers sessile or nearly so in dense short-pedunculate cymes, these arranged in a dense narrow panicle 4-7 cm. long; bractlets subulate, tomentose; hypanthium densely white-tomentose, the 4 calyx lobes subequal, oblong, obtuse or subacute, spreading, about equaling the hypanthium;

corolla dark red, the slender tube 12-15 mm. long, densely and closely white-tomentose outside, glabrous in the throat, the 4 lobes suborbicular, 2-3 mm. long; capsule subglobose, 4-5 mm. long, costate, brown, glabrate; seeds minute, irregular, brown, scrobiculate.

***Rondeletia linguiformis* Hemsl. Diag. Pl. Mex. 29. 1879.**

Type collected in Guatemala by Skinner, the locality unknown, but probably in the region of Quiriguá, Izabal, frequent on forested or brushy slopes below the pine forest, Montaña del Mico and vicinity, 40-600 m.; endemic.

A shrub or small tree 3-6 m. high, the branches subterete, glabrous; stipules obovate-spatulate or oblong-spatulate, 6-12 mm. long, erect, rigid, mucronate; leaves opposite, on petioles 4-8 mm. long, coriaceous, ovate-oblong or elliptic-oblong, sometimes oval-elliptic, 7-10 cm. long, 3-6 cm. broad, obtuse to long-acuminate, attenuate at the base, glabrous; inflorescence terminal, cymose-corymbose, open or dense, long-pedunculate, the flowers very numerous, subsessile, the bracts linear; hypanthium densely and minutely appressed-pilose, the 4 calyx lobes unequal, oblong-obovate, 0.5-1 mm. long, suberect; corolla white, strigose outside, the tube 8 mm. long, the throat naked, the 4 lobes rounded, 4 mm. long or less; capsule subglobose, 6 mm. in diameter; seeds numerous, angulate, reticulate-tuberculate.

The flowers are fragrant.

***Rondeletia macrocalyx* Standl. & Steyerl. Field Mus. Bot. 23: 254. 1947.**

Known only from the type, Izabal, Cerro San Gil, 300-900 m., in dense wet forest, *Steyermark 41864*.

A small tree of 6-7.5 m., the branches slender, when young densely hirsute with long, spreading, rather stiff, sordid hairs, the uppermost internodes mostly very short; leaves very thin on hirsute petioles 6-12 mm. long, elliptic or ovate, 9-17 cm. long, 4-7 cm. broad, short-acuminate or cuspidate-acuminate, obtuse to attenuate-cuneate at the base, rather densely hirsute on both surfaces with long slender spreading hairs, the lateral nerves about 7 pairs; inflorescences axillary or subterminal, cymose, 3-9-flowered, half as long as the leaves or shorter, the peduncles very slender, hirsute, 3-5.5 cm. long, the flowers on short or elongate pedicels; calyx lobes 4, narrowly lanceolate, subequal, about 15 mm. long, long-attenuate, foliaceous, hirsute on both surfaces; corolla white, densely hirsute outside with long, ascending or spreading, sordid hairs, the slender tube 18-25 mm. long, the 4 lobes spreading, obovate-oval, 7-8 mm. long, broadly rounded at the apex, glabrous within, the throat not barbate; immature capsule oblong-ovoid, 9 mm. long, 5 mm. broad, densely hirsute; seeds very numerous, small, angulate.

This is related to *R. mexiae* Standl. of Oaxaca, which has a smaller calyx and a much less conspicuous pubescence of short hairs.

Rondeletia myriantha Standl. & Steyerl. Field Mus. Bot. 22: 288. 1940.

Brushy slopes and banks, at about 1,000 m., Suchitepéquez (type from Finca Mocá, *Skutch 1569*). Known only from the type.

A slender shrub 3.5 m. tall or more, the branches terete, puberulent and sometimes tomentulose when young; stipules lance-triangular, attenuate, erect; leaves on petioles 7-15 mm. long, membranaceous, lance-oblong, 7-15 cm. long, 3.5-5 cm. broad, narrowly attenuate-acuminate, at the base acute or obtuse, green above and glabrous or pilosulous only along the nerves, beneath at first laxly and sparsely arachnoid-tomentulose, glabrate in age; inflorescence terminal, erect, narrowly elongate-thyrsoid and spikelike, pedunculate, about 8 cm. long and 2.5 cm. broad, laxly many-flowered, the flowers sessile or short-pedicellate; lowest bracts foliose but small, the upper ones linear, green; hypanthium almost 1 mm. long, densely white-tomentulose, the calyx 4-dentate, the teeth scarcely 1 mm. long, unequal, oval or oblong and very obtuse; corolla white, sparsely appressed-pilosulous, the slender tube 5 mm. long, the 4 lobes orbicular, 1.5 mm. long, glabrous within, the throat not barbate; stamens included; style short-exserted; capsule subglobose, costate, glabrate, 2.5-3 mm. long.

Rondeletia myriantha var. **armentalis** L. Wms. Phytologia 26: 127. 1973.

In moist woods at about 2,000 m., known only from the type from near Nebaj, Quiché, *Skutch 1776*.

Differs from the var. *myriantha* in having leaves densely tomentulose below; the hypanthium only sparsely pubescent; the calyx lobes subequal, narrowly triangular, prominently reflexed at anthesis, and with a minute gland in the sili of the lobes; the style included; the anthers somewhat exserted.

Rondeletia pansamalana Standl. N. Am. Fl. 32: 58. 1918.

Alta Verapaz; type from Pansamalá, 1,140 m., *Tuerckheim 897*.

A slender shrub, the branches terete, strigillose when young; stipules triangular-subulate, 4-6 mm. long, erect; leaves opposite, on slender petioles 3-15 mm. long, elliptic or ovate-elliptic, 9-15 cm. long, 3-4.5 cm. broad, attenuate or long-attenuate at the apex, abruptly acute to attenuate at the base, green and glabrous above, strigillose beneath along the veins; inflorescence terminal, pedunculate, the flowers short-pedicellate, in loose few-flowered pedunculate cymes, these arranged in a narrow thyrsoform panicle about 10 cm. long; bracts small, linear; hypanthium finely strigillose, pyriform-globose, the 4 calyx lobes very unequal, 3 of them small, lance-linear, and attenuate, the fourth elliptic-oblong, 2.5-3 mm. long, foliaceous, obtuse or acutish; corolla thinly strigillose, the rather stout tube 5-6 mm. long, the 4 lobes rounded, 1.5 mm. long, the throat naked; anthers and style included.

Rondeletia rubens L. Wms. Phytologia 26: 128. 1973.

Open montane forests at about 1,800 m.; Quiché (type, *Skutch 1725*). Endemic.

Slender shrubs to about 4 m. tall; branches slender, tomentose but very soon glabrous; stipules narrowly lanceolate, acute, subauriculate at the base, about 7-8 mm. long; leaves opposite, subequal to prominently anisophyllous, glabrous, elliptic or elliptic-lanceolate, acuminate, with 8-10 pairs of secondary nerves, petiole to 2 cm. long but mostly less than 1 cm. long; inflorescence a terminal circinnate-paniculate spike, many-flowered, up to 20 cm. long and 2-4 cm. broad, the ultimate divisions and hypanthium sparsely tomentose; hypanthium about 1 mm. long; calyx 4-lobate, the lobes lance-oblong, acute, glabrous within, sparsely tomentose outside, slightly unequal, 0.5-0.7 mm. long; corolla red, the tube slender, nearly glabrous outside, 7-8 mm. long, the lobes oblong-ovate, spreading, about 1.5 mm. long; style about 5 mm. long, bifid for 1 mm. and stigmatic; anthers inserted at the throat and slightly exserted, narrowly oblong, about 1.5 mm. long, filament very short.

Related to *R. gracilis* and *R. silvicola*. Known only from the montane forests near Nebaj.

Rondeletia rufescens Robinson, Proc. Am. Acad. 45: 402. 1910. *R. villosa* f. *strigosissima* Donn.-Sm. Enum. Pl. Guat. 2: 30. 1891, *nomen nudum*. *R. rufescens* var. *ovata* Robinson, l.c. 403 (type from Tactic, Alta Verapaz, *Tuerckheim* 8401).

Wet mixed forest or in thickets, 1,400-2,000 m.; Chiquimula (Cerro Brujo); Baja Verapaz (below Patal); Alta Verapaz (frequent and rather widely distributed). El Salvador; Honduras.

A shrub or small tree, 3 m. tall or more, the branches subterete, densely ferruginous-villous when young, tardily glabrate; stipules triangular, 5-12 mm. long, abruptly long-acuminate or cuspidate, erect; leaves opposite, on stout petioles 7-22 mm. long, elliptic-oblong to elliptic or ovate-oblong, 8-15 cm. long, 3-6 cm. broad, acute to attenuate, at the base rounded to acute, green and minutely pilose above, beneath densely pilose with short fulvous hairs; inflorescence terminal, short-pedunculate, the flowers sessile or subsessile in dense cymes, these sessile or pedunculate, arranged in a narrow thyrsiform panicle 12-20 cm. long; bracts linear-subulate; hypanthium densely ferruginous-pilose, the 4 calyx lobes lance-oblong, 1 mm. long, acute, spreading; corolla pale pink or rather dull red, the slender tube 8-10 mm. long, short-strigose below, long-strigose above, naked in the throat, the 4 lobes orbicular, 2 mm. long; style exserted; capsule subglobose, hirsutulous, about 3 mm. long.

A rather pretty shrub, plentiful at some localities in the vicinity of Tactic.

Rondeletia secundiflora Robinson, Proc. Am. Acad. 45: 403. 1910. *R. vulcanicola* Standl. & Steyer. Field Mus. Bot. 22: 291. 1940 (type from Finca Pirineos, southern slopes of Volcán de Santa María, 1,300-1,500 m., *Steyermark* 33220).

Moist or wet mixed, mountains forest, 600-1,500 m.; endemic; Escuintla (type collected along the road between Palín and

Escuintla, *Sutton Hayes* in 1860); Guatemala (?); Sacatepéquez; Chimaltenango; Sololá; Quezaltenango.

A slender shrub or small tree 1.5-6 m. high, the branches subterete, whitish-strigose when young; stipules erect, subulate from a short triangular base, 2.5 mm. long; leaves membranaceous, on petioles 5-15 mm. long, ovate-lanceolate to elliptic-lanceolate, long-attenuate, 5-15 cm. long and 1.5-5 cm. broad, narrowed to the acute or acuminate base, appressed-pilose above, beneath sparsely or rather densely appressed-pilose, barbate in the nerve axils; inflorescence terminal, narrowly paniculate and spikelike, 8 cm. long or less, the cymes sessile or short-pedunculate; bracts small and inconspicuous; hypanthium 1 mm. long, densely sordid-hirtellous, the 4 calyx lobes subequal or one lobe larger, linear or lanceolate, 1-1.5 mm. long, hispidulous; corolla dark purplish, strigose, the slender tube 6-8 mm. long, the suborbicular lobes 1.5 mm. long, glabrous within, the throat not barbate; capsule didymous-globose, about 4 mm. broad and 3 mm. high, hispidulous; seeds yellowish, obtusely angulate, coarsely punctate.

Rondeletia seleriana Loes. Verh. Bot. Ver. Brandenb. 65: 105. 1923.

In mountain forest or thickets, 2,500-2,800 m., or probably also at lower elevations; endemic; Huehuetenango (type collected near Chaculá, Distr. Nentón, *Seler 3015*; a photograph of the type in Herb. Field Mus.); also on Cerro Cananán.

A shrub or small tree, 6 m. high or less, the branchlets terete, when young sparsely strigillose; stipules subulate-deltoid, almost 1 cm. long, erect; leaves opposite, on petioles 4-11 mm. long, coriaceous, oblong-ovate to ovate-elliptic, 6-15 cm. long, 2-6 cm. broad, acuminate, at the base acute to almost rounded, glabrous above, somewhat strigillose beneath along the costa, the lateral nerves 5-7 on each side; inflorescence terminal, cymose-corymbose, the branches strigillose, the bracts minute, the flowers sessile or subsessile; hypanthium strigillose, the calyx lobes minute; corolla pink, strigillose and more or less fulvous-villosulous, the tube 10-12 mm. long, the rounded lobes 2 mm. long, the throat and inner face of the tube densely yellow-barbate; stamens included; style exserted.

Rondeletia septicidalis Robinson, Proc. Am. Acad. 45: 403. 1910.

San Marcos (volcanoes of Tajumulco and Tacaná, 1,400-2,100 m., in wet mixed forest). Mexico (Chiapas), the type from Chicharras.

A shrub or small tree 4-6 m. high, the branches slender, terete, ferruginous, thinly arachnoid-tomentose when young but soon glabrate; stipules triangular-lanceolate, 5 mm. long, erect; leaves opposite, subcoriaceous, anisophyllous, on petioles 5-35 mm. long, broadly ovate to lance-elliptic or lanceolate, 5-19 cm. long, 1.5-7 cm. broad, abruptly acuminate or long-attenuate, at the base acute or abruptly acuminate, green and glabrous above, when young thinly and loosely arachnoid-tomentose beneath but soon glabrous, the lateral nerves 5-9 on each side; inflorescence terminal,

slender-pedunculate, usually reflexed, the flowers subsessile in 2-3-flowered cymules, these remote and forming a spikelike panicle or a spike 6-30 cm. long; bracts linear, elongate; hypanthium densely floccose-tomentose, the 4 calyx lobes lance-linear, unequal, equaling or longer than the hypanthium, deflexed; corolla red, the slender tube 6-8 mm. long, glabrous below, floccose-tomentulose above, glabrous in the throat, the 4 lobes suborbicular, 2-3 mm. long; stamens and style included; capsule subglobose, 4 mm. in diameter.

Rondeletia silvicola L. Wms. *Phytologia* 26: 128. 1973.

Openings in wet lowland forests or in the forest near sea level, Izabal. Honduras (type, *Standley 56885*).

Slender shrubs or small trees to 8 m. tall; branches slender, terete, floccose but soon glabrescent; stipules narrowly triangular, 2.5-4 mm. long; leaves elliptic to oblanceolate-elliptic or oblong-elliptic, long acuminate, somewhat anisophyllous, lower surface obscurely arachnoid-floccose, soon glabrate, the blades 10-25 cm. long and 5-10 cm. broad, the petioles of a pair unequal, the longer ones to about 3 cm. long, obscurely floccose; the inflorescences terminal, spicate with numerous densely cymose clusters of flowers, 15-30 cm. long and 1-2 cm. in diameter; flowers pink to deep red; hypanthium floccose, to about 1 mm. long; calyx 4-lobate, the lobes narrowly triangular, reflexed at anthesis, glabrous within, about 0.5-0.7 mm. long; corolla red, arachnoid-floccose outside, the tube slender, 7-8 mm. long, the lobes spreading, suborbicular, 2-2.5 mm. long; style 4-5 mm. long, bifid; stamens inserted in the throat, the anthers included, linear-oblong, very small, about 0.8 mm. long; mature capsules subglobose, about 1.5 mm. long.

An occasional shrub or small tree in the forest or in forest openings along the north coast of Honduras and in the adjacent Guatemalan lowlands.

Rondeletia skutchii Standl. & Steyerl. *Field Mus. Bot.* 22: 289. 1940.

Moist or wet, mixed, mountain forest, 1,200-2,000 m.; endemic; Suchitepéquez (type collected on forested ridge, Finca Mocá, *Skutch 2110*); Sololá.

A slender shrub 4.5 m. high, the branches terete, the younger ones ferruginous, at first densely but laxly tomentose, soon glabrate; stipules subulate-attenuate from a triangular-lanceolate base, 7 mm. long, erect; leaves membranaceous, opposite, on petioles 1-1.5 cm. long, narrowly lance-oblong to oblong-elliptic, 10-15 cm. long, 3-6.5 cm. broad, acuminate or narrowly attenuate-acuminate, acute at the base, green above, at first sparsely and laxly tomentose, soon glabrous, rather densely and very laxly tomentose beneath, the lateral nerves about 11 on each side; inflorescence reflexed and pendulous, narrowly thyrsoid and spikelike, rather laxly many-flowered, short-pedunculate, 7-14 cm. long, about 3.5 cm. broad, the rachis densely tomentose, the flowers in dense, few-flowered, sessile or short-pedunculate cymules, the bracts linear, inconspicuous; hypanthium subglobose, densely white-tomentose, the 4 calyx lobes narrowly lance-triangular, long-attenuate, 2 mm. long; corolla floccose-

tomentose, the slender tube 10-12 mm. long, the 4 lobes rounded, glabrous within, the throat glabrous; stamens included.

Rondeletia stachyoides Donn.-Sm. Bot. Gaz. 43: 298. 1906.

Damp or wet forest, 900 m. or lower; Petén; Alta Verapaz (type from Semacoch, *Robert Hay*); Izabal; Huehuetenango (Ixcán). British Honduras; Honduras.

A slender shrub or small tree 4.5 m. tall or less, rarely larger, the branchlets terete, pilose-strigose when young; stipules triangular-subulate, erect, 6-10 mm. long; leaves opposite, on petioles 3-18 mm. long, ovate-lanceolate to narrowly elliptic-lanceolate, 6-17 cm. long, 1.5-4 cm. broad, long-attenuate, at the base attenuate or abruptly acuminate, bright green and lustrous above, glabrous, or strigose on the veins, densely sericeous beneath with long lustrous hairs or in age glabrate; inflorescence terminal, short-pedunculate, often recurved, the flowers fragrant, sessile or subsessile in small cymes, these spicate, the spikes 7-12 cm. long or longer, the bracts linear-subulate; hypanthium sericeous, the 4 calyx lobes lance-oblong, 3-4 mm. long, attenuate, spreading; corolla white, the slender tube 7-8 mm. long, glabrous except at the top, there densely setose-pilose, naked in the throat, the 4 lobes rounded, 1.5 mm. long; anthers and style included; capsule subglobose, 2.5 mm. long, costate, glabrate.

Rondeletia stenosphon Hemsl. Diag. Pl. Mex. 26. 1879. *R. lundelliana* Standl. in Lundell, Contr. Univ. Mich. Herb. 4: 31. 1940 (type from El Cayo District, Vaca, British Honduras, *Gentle 2504*). *Quinillo* (fide Aguilar).

Wet thickets or forest, 1,100-1,750 m.; Petén; Alta Verapaz (widely distributed and rather frequent); Baja Verapaz (Penzal); Quiché; Huehuetenango. Mexico (Chiapas); British Honduras.

A shrub or small tree 1-3 m. high or larger, sometimes a tree of 8 m., the stout branches acutely angulate, strigillose when young; stipules lance-triangular, 5-12 mm. long, erect; leaves opposite, subcoriaceous, on stout petioles 4-13 mm. long, obovate to oval-oblong or elliptic-oval, 7-15 cm. long, 4-7.5 cm. broad, usually abruptly short-acuminate, at the base subobtuse to acuminate, dark green and lustrous above, glabrous, beneath finely strigillose or glabrate; inflorescence terminal and axillary, cymose-corymbose, on stout peduncles 4-6 cm. long, cymose-corymbose, 8-14 cm. long, the cymes densely many-flowered, the flowers fragrant, sessile or short-pedicellate; bracts and bractlets usually minute, triangular; hypanthium densely sericeous, the 5 calyx lobes minute, ovate-triangular, acute, erect; corolla white, densely sericeous-strigose, the slender tube 8-11 mm. long, densely yellow-barbate in the throat, the 5 lobes oval, 2.5-4 mm. long, puberulent within; style included or exerted.

A showy and rather handsome shrub when in flower because of the abundant blossoms. A single specimen from near Flores, Petén (± 200 m.) is the only one known below 1,000 m. (*Contreras 5814*). It could be a mixed label.

Rondeletia strigosa (Benth.) Hemsl. Diag. Pl. Mex. 27. 1879. *Bouvardia strigosa* Benth. Pl. Hartweg. 75. 1841. *Jazmín; arete tinto* (Guatemala).

Widely distributed and common in many localities, 1,000-3,000 m., oak, pine, or mixed forest, in thickets, or on cliffs; Alta Verapaz (Cobán); Chiquimula; Jalapa; Jutiapa; El Progreso; Santa Rosa; Guatemala; Sacatepéquez; Chimaltenango; Quiché; Sololá; Suchitepéquez; Quezaltenango (type from Zunil, *Hartweg 530*); San Marcos. Mexico (Chiapas) to El Salvador and Honduras.

A shrub, sometimes 2 m. high but usually 1 m. high or less, the rather stout branches terete, deep green, hirtellous or puberulent when young; stipules very short, subtruncate; leaves mostly ternate, sessile or nearly so, ovate to ovate-oval, 2-5 cm. long, acute to acuminate, rounded or subtruncate at the base, strigillose, dark green above, paler beneath, the lateral nerves few, most of them rising from near the base of the blade at a very narrow angle; flowers terminal, umbellate, few or numerous, short-pedicellate; hypanthium densely strigose, the 5 calyx lobes linear or lance-linear, 6-10 mm. long, acute, ascending; corolla deep or bright red, sometimes dull purplish red, sparsely strigose outside, the slender tube 2-2.5 cm. long, densely yellow-pilose in the throat, the 5 lobes obovate-orbicular, 5-10 mm. long, glabrous within; anthers and style included; capsule globose, about 6 mm. long, strigose; seeds numerous, rather large, densely punctate, attenuate to each end, dark brown.

A somewhat showy and handsome plant because of its unusually colored flowers, which are larger than those of other Guatemalan species. The yellow centers of the corollas contrast with the deep red lobes. The deep green and rather tough and flexible branches also are distinctive.

Rondeletia suffrutescens Brandege, Univ. Calif. Publ. Bot. 6: 70. 1914.

Damp or wet, mixed forest or thickets of the western highlands, 1,300-3,000 m.; Suchitepéquez; Quezaltenango; San Marcos. Mexico (Chiapas), the type from Cerro del Boquerón.

A slender weak shrub, suberect or often scandent, 1-2 m. long, the branches terete, the younger ones green, at first sparsely pilosulous; stipules linear or triangular-lanceolate, 3-5 mm. long, erect; leaves opposite, membranaceous, on slender petioles 2-6 mm. long, lanceolate to ovate, 5-13 cm. long, 1.5-5 cm. broad, long-acuminate or attenuate, rounded or abruptly short-acuminate at the base, sparsely setose-pilose on both surfaces, to glabrous; inflorescence terminal, cymose, slender-pedunculate, the cymes mostly 3-flowered, the slender pedicels 5-15 mm. long; hypanthium glabrous, subglobose, 2 mm. long, the 5 calyx lobes linear-lanceolate, 6-14 mm. long, attenuate, green, sparsely setose-ciliate; corolla dull red or pale yellow, sometimes spotted with purplish, glabrous, the tube 15-21 mm. long, the throat densely yellow-barbate, the 5 lobes oblong or oval, 6-7 mm. long; anthers and style

included; capsule about 1 cm. long, conspicuously costate; seeds large, angulate, fuscous, coarsely tuberculate.

The shrub is an inconspicuous one, often growing in the deepest, wettest forest, and apparently is of infrequent occurrence.

Rondeletia tacanensis Lundell, Bull. Torr. Bot. Club 66: 603. 1939.

Wet mixed forest or thickets of the western highlands, 1,250-3,000 m.; Sololá; Quezaltenango; San Marcos. Mexico (Chiapas), the type from Volcán de Tacaná at 2,800 m., *Matuda* 2928.

A shrub or tree, sometimes 20 m. high and 15 cm. in diameter, but usually much smaller, irregularly branched, the branches subterete, densely tomentose when young; stipules triangular, erect, 5-9 mm. long; leaves opposite, membranaceous, on stout petioles 3 cm. long or less, elliptic, oval, or obovate-elliptic, 11-24 cm. long, 7-13 cm. broad, acute or abruptly short-acuminate, broadly cuneate at the base or contracted and short-decurrent, densely pilose above with chiefly subappressed hairs, densely hirsute beneath, the lateral nerves 12-16 on each side; inflorescence terminal, short-pedunculate, reflexed and pendent, the flower sessile in very dense cymes, these sessile or short-pedunculate and arranged in an interrupted spikelike panicle 15-35 cm. long; bracts linear or subulate, green, 5-7 mm. long or larger; hypanthium densely hirsute with subappressed hairs, the 4 calyx lobes linear or subulate, 4-8 mm. long, unequal, subfoliaceous, suberect; corolla dark dull red, sparsely pilose with somewhat appressed hairs, naked in the throat, the 4 lobes oval or rounded, about 5 mm. long, glabrous within; anthers exerted only at the apex, the style included or exerted.

The shrub is plentiful in many localities of the wet mountain forests of the western highlands. It is exceptionally conspicuous because of the many long narrow pendent panicles of rather brilliantly colored flowers. Heterostyly apparently occurs in this species.

Rondeletia zolleriana Standl. & Steyerl. Field Mus. Bot. 22: 292. 1940.

Wet mixed mountain forest, 1,800-2,400 m.; so far as known, endemic, but doubtless extending into Chiapas, Mexico; San Marcos (type collected on slopes between Finca El Porvenir and Loma Corona, southwestern slopes of Volcán de Tajumulco, *Steyermark* 37738).

A slender shrub 1.5-2.5 m. high, rarely a weak tree to 10 m., the branches terete, sparsely strigillose at first; stipules subulate-acuminate from a broad base, erect, 2.5-3 mm. long; leaves opposite, membranaceous, on slender petioles 5-13 mm. long, elliptic or elliptic-ovate, 5-10 cm. long, 2.5-5.5 cm. broad, abruptly and narrowly long-acuminate, acute or obtuse at the base and usually abruptly contracted, sparsely

villous above or almost glabrous, sparsely hirtellous beneath with subappressed hairs, often barbate in the nerve axils, the lateral nerves 5-6 on each side; inflorescence terminal, pedunculate or sessile, very lax, cymose-paniculate, few-flowered, as much as 5 cm. long, the flowers mostly in 3-flowered cymules, the pedicels 7 mm. long or less; bracts elongate, foliaceous, linear or linear-lanceolate; hypanthium oval, 2-2.5 mm long, densely whitish-strigose, the 4 calyx lobes very unequal, the largest lanceolate, 10 mm. long and 3 mm. broad, acuminate, 3-nerved, the other 3 linear or subulate, 5-7 mm. long; corolla white to ochroleucous, whitish-strigose, the tube 8-15 mm. long, the throat not barbate, the lobes suborbicular, almost 4 mm. long, broadly rounded at the apex, glabrous within.

This species was named for Mr. Erich Zoller of Finca El Porvenir, who furnished facilities for collecting on the lower slopes of the Volcán de Tajumulco. The species is locally abundant on the western slopes of the volcano at middle elevations.

RONDELETIA ROEZLII (Planch.) Hemsl. Biol. Cent. Am. Bot. 2: 23. 1881. *Rogiera roezlii* Planch. Fl. Serres 5: 442. 1849. This was based on cultivated specimens believed to have been of Guatemalan origin. It is not identifiable with certainty from the description but is probably a synonym of *R. amoena*.

RUDGEA Salisbury

Shrubs or small trees, glabrous or pubescent; stipules interpetiolar, bearing on the margins or at the apex or on the dorsal surface subulate or aculeiform teeth, these usually pale and somewhat cartilaginous, generally deciduous, the stipules sometimes lacinate; leaves opposite, short-petiolate or sessile, generally somewhat coriaceous; inflorescence terminal, usually paniculate or cymose, sometimes umbellate or capitate, rarely reduced to a single flower; calyx lobes almost free or variously connate; corolla salverform or funnelform, commonly white, the lobes valvate in bud; stamens inserted in the corolla tube, with short or elongate filaments; anthers dorsifixed, linear, included or exserted; ovary 2-celled, the style filiform or columnar, the 2 lobes orbicular or oblong; ovules solitary, erect from the base of the cell; fruit almost dry or juicy, bipyrenate, the nutlets plano-convex, smooth or sulcate dorsally, longitudinally sulcate on the inner face.

A large group of perhaps 75 species in tropical America. Five other Central American species have been described from Costa Rica and Panama. The genus *Rudgea*, like others in the tribe Psychotrieae, is difficult to distinguish from *Psychotria* and is a genus of "convenience."

Corolla about 1 cm. long; flowers in part conspicuously pedicellate; upper leaves usually narrowed to a narrowly obtuse base.....*R. cornifolia*.
Corolla almost 2 cm. long; flowers all sessile or nearly so; leaves narrowed to an acute or acuminate base.....*R. simiarum*.

Rudgea cornifolia (Humb. & Bonpl.) Standl. Field Mus. Bot. 7: 432. 1931. *Psychotria cornifolia* Humb. & Bonpl. ex R. & S. Syst. Veg. 5: 191. 1819. *P. fimbriata* Benth. in Hook. Journ. Bot. 3: 226. 1841. *R. micrantha* Muell. Arg. Flora 59: 454. 1876. *R. fimbriata* Standl. in Standl. & Cald. Lista Pl. Salv. 274. 1925. *R. ceratopetala* Donn.-Sm. Bot. Gaz. 35: 3. 1903 (type from Cubilgüitz, Alta Verapaz, *Tuerckheim* 7904). *Canela de montaña* and *palito copal* (Quezaltenango; probably erroneous names). Figure 50.

Wet forest or thickets, ranging from sea level to about 1,400 m.; Petén; Izabal; Sololá; Huehuetenango; Quezaltenango (southern slopes of Volcán de Santa María). Southern Mexico to Panama, southward to Bolivia and Brazil.

A glabrous shrub 2-4 m. high; stipules deltoid-ovate, incised-laciniate; leaves sessile or short-petiolate (especially the lower ones), elliptic to elliptic-oblong or obovate, 8-15 cm. long, 2-7 cm. broad, gradually or rather abruptly acuminate, commonly narrowed to an obtuse or narrowly rounded base (especially the upper leaves); inflorescence cymose-paniculate, usually small, broad and open, many-flowered, the lateral flowers of the cymules pedicellate, the cyme erect, pedunculate; calyx short, minutely 5-dentate or subentire; corolla white, commonly 5-7 mm. long, the lobes equaling or longer than the tube; fruit ellipsoid, white, 5-8 mm. long in the dry state.

Called "membrillo" and "tapacajete" in Oaxaca.

Rudgea simiarum Standl. & Steyerl. Field Mus. Bot. 22: 389. 1940.

Izabal (type collected between Virginia and Lago de Izabal, Montaña del Mico, 50-500 m., *Steyermark* 38839).

A glabrous tree 6 m. high; stipules persistent, forming a truncate, obscurely mucronate sheath 2.5-3 mm. long, this densely hirsute within, the hairs exserted; leaves on petioles 8-15 mm. long, lance-oblong to elliptic-oblong, usually broadest near the middle, 7-16 cm. long, 2.5-7 cm. broad, rather abruptly long-acuminate, acute or long-decurrent at the base, the lateral nerves about 8 on each side; inflorescence cymose-corymbose, densely few-flowered, 2-2.5 cm. broad (excluding the flowers), the peduncle 2-3.5 cm. long, erect, the flowers sessile or nearly so; hypanthium thick-columnar, scarcely 1 mm. high, the calyx scarcely 0.5 mm. high, remotely and very minutely dentate; corolla white, obtuse at the apex in bud and not appendaged, the tube 10-11 mm. long, the lobes 8 mm. long, linear-lanceolate, spreading or recurved; anthers exserted, 3 mm. long.

The junior author believes that this plant, of which only the type is known, may be a *Psychotria*.

SABICEA Aublet

Shrubs, woody or perhaps herbaceous vines (ours) or small trees, scandent or not; stipules intrapetiolar, persistent; inflorescence axillary, the subsessile heads or

short pedunculate thyriform panicles hardly longer than the petioles; flowers small, whitish; hypanthium globose; the calyx 3-6-lobate, the lobes usually elongate and narrow, equal or not, persistent; corolla funnellform or salverform, the tube short or elongate, the throat villous, the limb 4-5-lobate, the lobes short, valvate in bud; stamens 4-5, inserted in the throat or tube of the corolla, the filaments long or short, the anthers dorsifixed, linear, obtuse, included; ovary usually 4-5-celled, sometimes only 2-celled, the style with 2-5 linear, obtuse, lobes; ovules numerous, the placentae affixed to the axis of the ovary; fruit baccate (when mature), 2-5-celled; seeds numerous, minute, ovoid or angulate.

A large genus of perhaps more than 100 species in Africa and tropical America, mostly in South America. There may be other species in Mexico and southern Central America.

Pubescence of the stems closely appressed; inflorescence when developed rather lax and short pedunculate.....*S. panamensis*.
 Pubescence of the stems of spreading hairs; inflorescence dense, sessile or not obviously pedunculate.....*S. villosa*.

Sabicea panamensis Wernham, Monogr. Sabicea 30. 1914. *S. costaricensis* Wernham, l.c. 31.

Wet thickets or forests, often in second growth, at or little above sea level; British Honduras; to be expected in Petén; Izabal; Baja Verapaz. Southward to Panama.

A small woody vine, climbing over shrubs, the stem ferruginous or purplish, densely yellowish-sericeous when young; stipules ovate or ovate-oval, 7-10 mm. long and 4-6 mm. broad, acute or obtuse; the petioles stout, 1-1.5 cm. long; leaf blades elliptic-lanceolate to ovate-oblong, mostly 7-10 cm. long and 3-5 cm. broad, acute or abruptly short-acuminate, the base rounded, sparsely strigose or strigillose above, sericeous-strigose beneath along the veins; elsewhere sparsely strigose or glabrate; inflorescence rather lax and thyriform, several-flowered, little exceeding the petioles, densely yellowish-strigose, 2-3 cm. broad, the peduncle mostly 1 cm. long or shorter, the pedicels to 8 mm. long; bracts lanceolate, connate at the base; calyx lobes linear or oblong, 2-3.5 mm. long, green, reflexed at maturity; corolla whitish, strigose outside, the tube 6-8 mm. long, the lanceolate lobes about 2.5 mm. long; fruits about 1 cm. long, dark purple or lavender when mature.

The species was described by Wernham as an erect shrub, and it is often so indicated on labels, but there is little reason for believing that any Central American member of the genus is erect.

Sabicea villosa Roem. & Schult. Syst. Veg. 5: 265. 1819. *S. hirsuta* HBK. Nov. Gen. & Sp. 3: 417. 1820. Figure 25.

Wet thickets, often in second growth, 600 m. or less; Alta Verapaz; Izabal; Retalhuleu (near city of Retalhuleu). Southern Mexico and British Honduras along the Atlantic slope to Costa Rica. Panama south to Brazil and Peru along both oceans.

A slender vine, either somewhat woody or wholly herbaceous, the stems densely fulvous-hirsute; stipules broadly ovate or rounded, reflexed, 5-10 mm. long, obtuse or acutish; leaves short petiolate, ovate to ovate-oblong or elliptic-oblong, 5-12 cm. long and 2-2.5 cm. broad, rather abruptly acuminate, rounded or obtuse at the base and often short-decurrent, abundantly hirsute; inflorescence sessile in the leaf axils, flowers few and crowded; calyx and hypanthium densely hirsute, the calyx lobes linear-lanceolate, 2-4 mm. long, reflexed at maturity; corolla white, hirsute or strigose, the tube about 6 mm. long, the narrowly triangular lobes 1.5-2 mm. long; fruit dark purple or dark red, about 1 cm. long, baccate and juicy at maturity; seeds brown.

A single specimen is known along the Pacific coast in Central America. The species is found along the coast from Panama southward. The locality in Retalhuleu is unexpected.

SICKINGIA Willdenow

Glabrous or pubescent trees, with thick branchlets; stipules ovate or lanceolate to triangular, caducous; leaves large, opposite, petiolate, usually membranaceous; inflorescence paniculate, the panicles terminal or axillary, the small flowers usually short-pedicellate, bracteolate or ebracteolate; hypanthium obconic, the calyx short, shallowly lobate, cupular or campanulate; corolla tubular or funnelform, usually pilose within at the insertion of the stamens, the limb 4-5-lobate, the lobes short and broadly rounded, imbricate or open in bud; stamens inserted below the middle of the corolla tube, exerted, the filaments villous; anthers rather large, versatile, oblong; ovary 2-celled, the style stout, with 2 short branches; ovules very numerous, the placentae elongate, longitudinally adnate to the septum; capsule globose, 2-celled, bivalvate, woody; seeds large, horizontal, lunulate or semi-oblong, broadly winged.

A small genus of some 30 species mostly in South America. Two or three others are known from Mexico and three more from Central America and Panama. *Sickingia calderoniana* Standley may be expected in eastern Guatemala, and *S. rhodoclada* Standley in western Guatemala.

The descriptions, as well as the key, are based on insufficient and often inadequate material. The senior author had placed most of the Guatemalan and British Honduran material we have seen in *S. salvadorensis*. He may have been right.

Petioles about 1 cm. long; branchlets pilose *S. vestita*.
 Petioles longer than 1 cm., glabrous; branchlets glabrous or nearly so.

Leaves lanceolate to oblong-lanceolate, acute at the base *S. lancifolia*.

Leaves oblong-obovate, somewhat narrowed to the rounded or emarginate base.

S. salvadorensis.

Sickingia lancifolia Lundell, *Wrightia* 4: 50. 1968; *S. lancifolia* var. *puberula* Lundell, l.c. 51.

Wet forests or along streams or lakes, Petén (type *Lundell 18224* and type of the variety *Contreras 3514*); Alta Verapaz. Endemic.

Small trees or shrubs 1.5 m. or taller; branchlets minutely puberulent, terete, stipules to 2 cm. long; leaves oblong-lanceolate to lanceolate, acuminate, acute to the base, glabrous, 10-20 cm. long and 1.5-6 cm. broad, petioles mostly 1 cm. long; inflorescence terminal, small, said to be to 7 cm. long; capsule subglobose, 1.5-2 cm. in diameter.

This species is known only from a fruiting or sterile specimen.

Sickingia salvadorensis Standl. Field Mus. Bot. 12: 390. 1936. *Calderonia salvadorensis* Standl. Journ. Wash. Acad. Sci. 13: 290. 1923. *Tapalcuite*; *colay* (Alta Verapaz); *palo colorado* (Petén, fide Lundell); *chacahuante*; *chactemuch* (Petén, Maya); *tapalcuit*; *tapalcuito*; *palo de puntero*; *John Crow redwood* (British Honduras).

Frequent in forests or thickets of the plains or low hills of both coasts, often on limestone, 250 m. or lower; Petén; Alta Verapaz; Santa Rosa; Escuintla; Suchitepéquez; Retalhuleu. Mexico (Yucatan); British Honduras; El Salvador.

Usually a small or medium-sized tree about 10-12 m. high, reported as sometimes 30 m. high with a trunk 30 cm. or more in diameter, the bark smooth, pale, the young branchlets puberulent; stipules linear-lanceolate, about 2 cm. long, glabrous; petioles slender, 2-3 cm. long, the blades mostly oblong-obovate, 12-24 cm. long, 5-12 cm. broad, acute or short-acuminate, somewhat narrowed to the rounded or emarginate base, puberulent beneath along the nerves, barbate in the nerve axils and domatiate, the lateral nerves 10-12 on each side; panicles 8-15 cm. long, dense and many-flowered, the rachis minutely puberulent, the flowers mostly sessile; hypanthium 3 mm. long, glabrous; calyx 1.5 mm. long, the lobes rounded, minutely ciliolate; corolla whitish or yellowish, 5 mm. long; filaments about equaling the corolla lobes, the anthers 2.5 mm. long; capsule subglobose, about 2 cm. in diameter, with numerous large pale lenticels; seeds, including the wing, about 15 mm. long and 6 mm. broad.

Known in El Salvador by the names "campeche," "brasil," "palo colorado," "drago," and "sangre de chuchó." When cut, the wood turns red, but this color fades with age and upon exposure to bright light. It is yellowish when first cut, hard, heavy, strong, fine-textured, easy to work, finishes smoothly, and is not very durable. It is little used locally, but is reported as suitable for articles of turnery and carving. In British Honduras the wood is used for dyeing hammocks and other articles red. The tree is frequent about Retalhuleu, as high up as San Felipe, and extends far down the plains. Often it is seen growing in the fincas. About Chiquimulilla and Guazacapán also the tree is common, growing everywhere

through the towns, apparently planted. The wood is used for fuel at Mazatenango, but is said not to be very good for this purpose. It is easily recognized wherever found freshly cut because of the red coloring.

Sickingia vestita Lundell, *Wrightia* 4: 51. 1940. *S. mollis* Lundell, *Contr. U. Mich. Herb.* 4: 32. 1940, not Standl. *Chuc chenuch* (British Honduras, Maya).

Wet lowland forest, near sea level; Petén. Mexico; British Honduras.

Trees to 15 m. and 0.3 m. in diameter, the branchlets terete, pilose-tomentose but soon glabrate, stipules lanceolate, to 1.7 cm. long, ciliate; leaves ovate-oblong, obtuse to subacuminate, subcordate at the base, about 10 cm. long and 5.5 cm. broad, glabrous above or soft pilose, petioles thick, about 1 cm. long, pilose-tomentose; capsule subglobose, 2-3 cm. in diameter.

This, like other *Sickingias* in Guatemala, is inadequately known.

SOMMERA Schlechtendal

Reference: Louis O. Williams, *Sommerera* in North America, *Phytologia* 26: 121-126. 1973.

Shrubs or small trees, more or less pubescent, with terete branchlets; stipules interpetiolar, large, caducous; leaves opposite, large, membranaceous, conspicuously lineolate between the veins with numerous fine parallel striations; flowers small, whitish, in pedunculate axillary cymes, corymbs, or racemes, bracteate and bracteolate; hypanthium turbinate; calyx 5-lobate, almost bilabiate, the lobes subfoliaceous, equal or unequal, persistent; corolla funnelform or subcampanulate, fleshy with the center line of lobes thickened, sericeous outside, the throat villous, the limb 5-lobate, the lobes short or elongate, valvate in bud; stamens 5, inserted in the corolla throat, the filaments short, barbate; anthers dorsifixed, oblong, obtuse at each end; ovary 2-celled, the style short, with linear obtuse branches, glabrous or hirsute; ovules numerous, the placentae adnate to the septum; fruit baccate, globose or ovoid, 2-celled; seeds numerous, minute, obtusely angulate, the testa thin, foveolate.

About 15 species in tropical America. Four others are known from southern Central America and Panama and five additional ones from Mexico.

Leaves sparsely pilose on the upper surface; branchlets pilose*S. guatemalensis*.

Leaves quite glabrous on the upper surface; branchlets glabrous or nearly so.

S. chiapensis.

Sommerera chiapensis Brandegee, *Univ. Calif. Publ. Bot.* 6: 196. 1915.

San Marcos, southern slopes of Volcán de Tajumulco, 1,300-1,500 m., in forested ravines. Mexico (Chiapas), the type from Finca Irlanda.

A tree of 9-12 m. with brownish branchlets, the young branchlets glabrous; stipules linear-lanceolate, 1.5-3.5 cm. long, brown, attenuate, glabrous; petioles slender, 2-5 cm. long, the blades obovate or obovate-oblong, 12-25 cm. long, 5-10 cm. broad, abruptly acuminate, abruptly acuminate or attenuate at the base, bright green above and glabrous, paler beneath, densely sericeous when young but soon glabrate; inflorescence racemose or cymose-racemose, few-flowered, on a long or short peduncle, the pedicels 2-3 mm. long or more; bracts small, oblong, obtuse; calyx lobes semiorbicular or ovate-orbicular, ciliolate; corolla white, 7-8 mm. long, very densely sericeous outside; fruit globose or oval, about 1 cm. long, glabrous.

Sommeria guatemalensis Standl. Contr. U. S. Nat. Herb. 17: 436. 1914. Figure 26.

Usually in dense wet forest at 350-1,600 m.; Alta Verapaz (type collected near Cubilgüitz, *Tuerckheim* 8225); Huehuetenango; endemic.

A shrub or small tree, sometimes 8 m. high, with reddish brown branches, these sparsely lenticellate, appressed-pilose when young but soon glabrate; stipules narrowly lanceolate, 3.5-4.5 cm. long; petioles 2-5 cm. long, the blades oval to oblong-obovate, 17-30 cm. long, 8-14 cm. broad, rather abruptly acuminate, acute or obtuse at the base, sericeous above when young but soon glabrate, appressed-pilose beneath along the veins; inflorescence cymose-corymbose, many-flowered, the peduncles 2-5 cm. long, the flowers sessile or short-pedicellate; bracts broadly ovate or oblong, obtuse or abruptly short-acuminate; hypanthium 3-4 mm. long, densely sericeous; calyx lobes 5, oval or broadly ovate, unequal, 3-6 mm. long, usually acute or acuminate, sometimes obtuse, sparsely short-pilose; corolla pinkish white or cream-colored, densely sericeous outside, the tube 6-8 mm. long, the lobes one-fifth to one-third as long as the tube, triangular-ovate, acute; fruit globose-oval, 12 mm. long, sparsely sericeous.

The oldest name in this genus is *Sommeria grandis* (Bartling) Standl., which was collected by Haenke in Mexico, and to it have been referred most of the North American collections at one time or another.

SPERMACOCE Linnaeus

Annual herbs, usually erect or suberect, glabrous or pubescent, the stems tetragonous; stipules united with the petioles to form a multisetose sheath; leaves opposite, petiolate or sessile, herbaceous, narrow, often blackening when dried; flowers very small, white or pinkish, in dense axillary and terminal heads, the terminal heads subtended by an involucre of 2 or more leaflike bracts; hypanthium obovoid, the calyx 4-dentate, the lobes usually green; corolla funnelform, the limb 4-lobate; stamens 4, inserted in the corolla tube; ovary 2-celled, the style slender, the stigma capitate or shallowly bilobate; fruit dicoccous, coriaceous, one of the cocci

dehiscent ventrally, the other usually indehiscent; seeds 1 in each cell, oblong, convex dorsally.

Perhaps a dozen species, natives of the warmer parts of America, with some of them perhaps introduced into other parts of the tropical world.

Plants glabrous throughout; fruit glabrous.....*S. riparia*.

Plants more or less pubescent, often densely so; fruit pubescent.

Stems densely hispid with long spreading hairs; leaves conspicuously hispid, especially beneath*S. tetraquetra*.

Stems almost glabrous but usually scabrous on the angles; leaves merely scabrous or almost glabrous.....*S. confusa*.

Spermacoce confusa Rendle, Journ. Bot. 74: 12. 1936; L. Wms. Phytologia 26: 493. 1973. *Hierba de pájaro* (fide Aguilar).

Common in the east of Guatemala at low elevations, also in Guatemala and Huehuetenango, ascending to 1,800 m.; a weedy plant, growing in waste ground, cornfields, sand spits, or thickets; Zacapa; Chiquimula; Jalapa; Jutiapa; Santa Rosa; Guatemala; Huehuetenango. Generally distributed in tropical America.

Plants slender, erect or spreading, 60 cm. high or less, often much branched, the stems 4-angulate, usually scabrous, at least on the angles; leaves ovate-lanceolate to linear-lanceolate, 2-7 cm. long, acuminate, scaberulous on one or both surfaces; flower heads containing few or many flowers, about 7 mm. in diameter; sepals ovate-triangular, very small; corolla white or purplish, glabrous, scarcely 2 mm. long; fruit subglobose, 2 mm. in diameter, minutely hispidulous with whitish hairs.

Called "hierba de Santa Clara" in El Salvador; "taulmil" (Yucatan, Maya).

We have called attention to the fact that the name *Spermacoce confusa* is not acceptable since it has no basis. The problem of finding or making an acceptable name for our plants would require a revision of the group and more time than we have available to us. The problem is left for a monographer. The plant here described, and similar species, have often gone under the name of *S. tenuior* L., the type species of the genus *Spermacoce*. Dr. Rendle's name is a new name for *S. tenuior* of authors, which is to say that it may be and probably is a "conglomerate."

Spermacoce riparia Cham. & Schlecht. Linnaea 3: 355. 1828. Figure 65.

Of scattered occurrence and not common, usually in damp thickets, sometimes in ditches, often in open fields, 1,500 m. or

lower; Petén; Alta Verapaz; El Progreso; Zacapa; Escuintla; Suchitepéquez. Mexico; British Honduras to Panama and through much of South America; West Indies.

A glabrous annual, erect or ascending, 20-50 cm. high, often much branched; leaves oblong to oblong-lanceolate or narrowly elliptic, 3-8 cm. long, acuminate, narrowed to the base, short-petiolate, usually blackening when dried; flower heads about 7 mm. in diameter, usually many-flowered; calyx lobes ovate or deltoid, acute; corolla white, little exceeding the calyx lobes; capsule glabrous, 1.5-2 mm. long.

This plant usually has been referred to *S. glabra* Michx., a species of southeastern United States, which differs in having much larger flower heads.

Spermacoce tetraquetra A. Rich. in Sagra, Hist. Cub. 11: 29. 1850.

Northern British Honduras, and doubtless extending into Petén. Mexico (Veracruz and Yucatan); Cuba and Bahamas.

Usually erect and 30-60 cm. high, hirsute or hispid throughout with harsh spreading hairs, the stout stems acutely angulate; stipule sheath with numerous long setae; leaves lanceolate to oblong-lanceolate, 2-8 cm. long, 2.5 cm. broad or less, acute, narrowed to a short stout petiole, conspicuously nerved; flower heads small and mostly few-flowered, inconspicuous; calyx lobes lanceolate, acuminate; corolla white, twice as long as the calyx lobes, glabrous outside, densely barbate in the throat; fruit 2 mm. long, densely hispidulous with whitish hairs.

The Maya name is reported from Yucatan as "poc-xum." The plant is used medicinally by the Yucatecans.

STEYERMARKIA Standley

Perennial herbs, acaulescent or nearly so, densely long-hirsute; leaves opposite, crowded at the apex of the short stem, large, membranaceous, short-petiolate; stipules linear-lanceolate, persistent; flowers very large, 4-parted, pink, cymose, the cymes dense, many-flowered, head-like, sometimes subracemose, long-pedunculate, axillary, the bracts large, linear, foliaceous; hypanthium semiglobose or campanulate, covered with very long hairs; calyx lobes 4, almost free, linear, erect, persistent; corolla salverform, densely long-pilose outside, the tube elongate, slender, scarcely dilated in the throat, not barbate within, the limb less than half as long as the tube, 4-lobate, the lobes subequal, broadly oval, rounded at the apex, pilose within with 2-3-celled hairs, contorted in bud; stamens inserted in the throat of the corolla tube, included, the filaments short; anthers dorsifixed, linear, obtuse; disk annular; ovary 2-celled, the style filiform, the 2 branches short, oblong-linear, subrecurved, included; ovules numerous, the placentae affixed to the septum, anatropous; capsule subglobose, rather large, coriaceous, 2-celled, loculicidally 2-valvate; seeds numerous, minute, globose, not angulate, the testa slightly reticulate.

The genus consists of a single species.

Steyermarkia guatemalensis Standl. Field Mus. Bot. 22: 216. 1940. Figure 10.

Known only from the type, Izabal, Río Dulce, 2-4 miles west of Livingston, on the south side of the river, at sea level, *Steyermark* 39520; in flower April 16.

Stems 8 cm. long or shorter, thick, with very short nodes, densely leafy near the apex; stipules linear-lanceolate, as much as 2 cm. long, long-attenuate, densely white-hirsute outside, glabrous within; leaves large, membranaceous, the petioles sometimes 4 cm. long but usually much shorter, long-hirsute; leaf blades oblanceolate-oblong, 16-28 cm. long, 5-10 cm. broad, acute or acuminate, narrowly attenuate to the base, green above and densely long-hirsute, the hairs as much as 6 mm. long, paler and more densely long-hirsute beneath, the lateral nerves about 16 pairs; peduncles axillary, 9-12.5 cm. long, naked, long-hirsute, the inflorescence dense, congested, head-like, about 5 cm. broad (excluding the corollas), or the inflorescence composed of 3 head-like cymes; lowest bracts green, as much as 2 cm. long, narrowly lanceolate, long-attenuate; flowers sessile or short-pedicellate; hypanthium short, densely glandular-pilose; calyx lobes narrowly linear, erect, 10-14 mm. long, hirsute, with a black digitiform gland on each side at the base; corolla densely hirsute with long spreading white hairs, the slender tube 3.5-4 cm. long, 2 mm. broad, the lobes spreading, about 2 cm. long and 1 cm. broad, orchid-pink, the tube glabrous within; anthers 5-6 mm. long, the filaments 2 mm. long, glabrous; capsule 7-8 mm. long, densely long-hirsute, rounded at the base; seeds 0.4 mm. in diameter, dark brown.

This genus is related to *Sipanea*, a chiefly South American group of plants with small flowers, 5-parted corollas, and elongate leafy stems. *S. guatemalensis* is a showy and conspicuous plant, apparently of very restricted distribution. The habitat may have been destroyed where the plant was collected more than 30 years ago.

UNCARIA Schreber

Scandent shrubs, glabrous or pubescent, climbing by stout uncinate spines, these formed from abortive peduncles; stipules interpetiolar, entire or bifid; leaves opposite, petiolate; inflorescences dense spherical pedunculate heads, sessile or pedicellate, axillary and solitary, or paniculate; flowers yellowish, usually pubescent; hypanthium elongate, fusiform, the calyx campanulate, funnel-form, or short-tubular, 5-lobate or 5-parted; corolla small, tubular-funnel-form, with elongate tube, glabrous in the throat, the limb 5-lobate, the lobes valvate in bud; stamens 5, inserted in the corolla throat, with short filaments, the anthers oblong, dorsifixed, bisetose at the base; ovary fusiform, 2-celled, the style slender, long-exserted, the stigma capitate; ovules numerous, ascending, the placentae affixed to the septum; capsule small, elongate, 2-celled, septicidally bivalvate, the valves biparted; seeds numerous, imbricate, the testa winged at each end.

About 35 species, chiefly in tropical Asia and Africa, with one additional one in South America.

Uncaria tomentosa (Willd.) DC. Prodr. 4: 349. 1830. *Nauclea aculeata* HBK. Nov. Gen. & Sp. Pl. 3: 382. 1819, not *N. aculeata*. Willd., 1797. *N. tomentosa* Willd. ex R. & S. Syst. Veg. 5: 221. 1819. *Ourouparia tomentosa* Schum. in Mart. Fl. Bras. 6, pt. 6: 132. 1889. Figure 20.

Wooded swamps, Izabal, near sea level; probably also in Petén. British Honduras to Panama, southward to eastern Peru.

A shrub or small tree, scandent or at least with long, pendent or clambering branches, the branches tetragonous, densely or sparsely pilose or puberulent, in age glabrate; stipules broadly oblong-ovate to deltoid-rounded, 6-11 mm. long, obtuse or rounded at the apex, often reflexed; leaves on stout petioles 7-15 mm. long, oval or ovate-oval, 10-15 cm. long, 5.5-8.5 cm. broad, very shortly obtuse-acuminate, at the base broadly rounded or cordate, bright green and glabrous above, paler beneath, whitish-tomentulose, or in age glabrate except along the pilose veins; flower heads spherical, often in panicles, numerous, about 6 mm. in diameter (exclusive of the corolla), the naked peduncles 3.5 cm. long or less, often compressed, the lowest ones usually sterile and spinose, large, flat, recurved; flowers sessile; calyx and hypanthium about 2 mm. long, the hypanthium sericeous, the calyx obscurely 5-dentate, puberulent, the teeth rounded; corolla 6 mm. long, densely retrorse-pilose outside with appressed yellowish hairs, the lobes oval or oblong, rounded at the apex; fruit trigonous, 2-3 mm. long.

It is said that this plant is a water vine, i. e., the sap from sections of the stem may be used as a substitute for drinking water. In Honduras the vine is called "uña de guara." In some parts of the Atlantic coast of Central America it is reported to become a troublesome weed in banana plantations.



FIG. 1. *Portlandia guatemalensis*. A, branch in flower, $\times \frac{1}{2}$; B, corolla, stamens, and style, $\times 1 \frac{1}{4}$.



FIG. 2. *Pogonopus speciosus*. A, flowering branch, $\times \frac{1}{2}$; B, flower, $\times 1 \frac{1}{2}$; C and D, flower dissected to show detail, $\times 2 \frac{1}{2}$; E, base of filament, much enlarged; F, anther and apex of filament, $\times 5$.



FIG. 3. *Oldenlandia corymbosa*. A, plant, $\times \frac{1}{2}$; B, branch, $\times 2$; C, flowers, $\times 5$; D, flower dissected, $\times 7 \frac{1}{2}$; E, fruits, $\times 5$.



FIG. 4. *Houstonia serpyllacea*. A, habit and branch, $\times 1$; B, fruiting branch, $\times 5$; C, flower, $\times 4$; D, flower dissected showing calyx, style, and corolla, and anthers, $\times 5$; E, anther, $\times 7$; F, section of capsule, $\times 5$; G, seed, $\times 20$, with detail of surface.



FIG. 5. *Rondeletia buddleioides*. A, flowering branch, $\times \frac{1}{2}$; B, tomentum from under leaf surface, much enlarged; C, outline of leaf from another specimen, $\times \frac{1}{2}$; D, segment of inflorescence, $\times 2 \frac{1}{2}$; E, flower at anthesis and at left apices of other flowers in process of opening, $\times 5$; F and G, flower dissected to show details, $\times 5$; H, portion of fruiting inflorescence, $\times 4$; I, seed, $\times 20$.



FIG. 6. *Lindenia rivalis*. A, flowering branch, $\times 1$; B, fruiting branch, $\times \frac{1}{2}$; C, ovary, calyx, and style (12 cm. of style left out), $\times 1$; D, capsule opened and partially dissected to show seeds, $\times 1$; E, seeds, $\times 5$; F, circumaxile (and intrapetiolar) stipule, $\times 2 \frac{1}{2}$.



FIG. 7. *Deppea flava*. A, flowering branch, $\times \frac{3}{4}$; B, cymose inflorescence showing mature flower and buds, $\times 4$; C, partial dissection of flower, $\times 4 \frac{1}{2}$; D, portion of fruiting branch with dehiscent capsules above, $\times 1 \frac{1}{2}$; E, mature capsule, $\times 2 \frac{1}{2}$; F, seed, $\times 15$. Detail of leaf shows lineolate tertiary veins on lower leaf surface.



FIG. 8. *Deppea grandiflora*. A, flowering branch, $\times \frac{1}{2}$; B, flower, $\times 3$; C, corolla dissected, $\times 2$; D, hypanthium, calyx, and style, $\times 2$; E, stigma, $\times 5$.



FIG. 9. *Pinarophyllon flavum*. A, plant, $\times \frac{1}{2}$; B, pubescence of leaf, much enlarged; C, portion of cymose inflorescence showing flowers at various stages, $\times 6$; D, corolla dissected, $\times 7$.



FIG. 10. *Steyermarkia guatemalensis*. A, habit of plant in flower, $\times \frac{1}{2}$; B, mature hypanthium and calyx, $\times 6$; C, corolla partially dissected to show detail, $\times 1 \frac{1}{2}$; D, outer surface of limb of corolla, $\times 1 \frac{1}{2}$; E, young flower bud, $\times 1 \frac{1}{2}$; F, seed, $\times 20$; G, cross-section of ovary, $\times 3$. Sketch of Dr. Julian A. Steyermark for whom the genus is named.



FIG. 11. *Bouvardia longiflora*. A, branch with flowers and a fruit, $\times \frac{1}{2}$; B, fruits, $\times 1 \frac{1}{2}$; C, flower, $\times 1$; D, and E, flower dissected, $\times 1 \frac{1}{2}$.

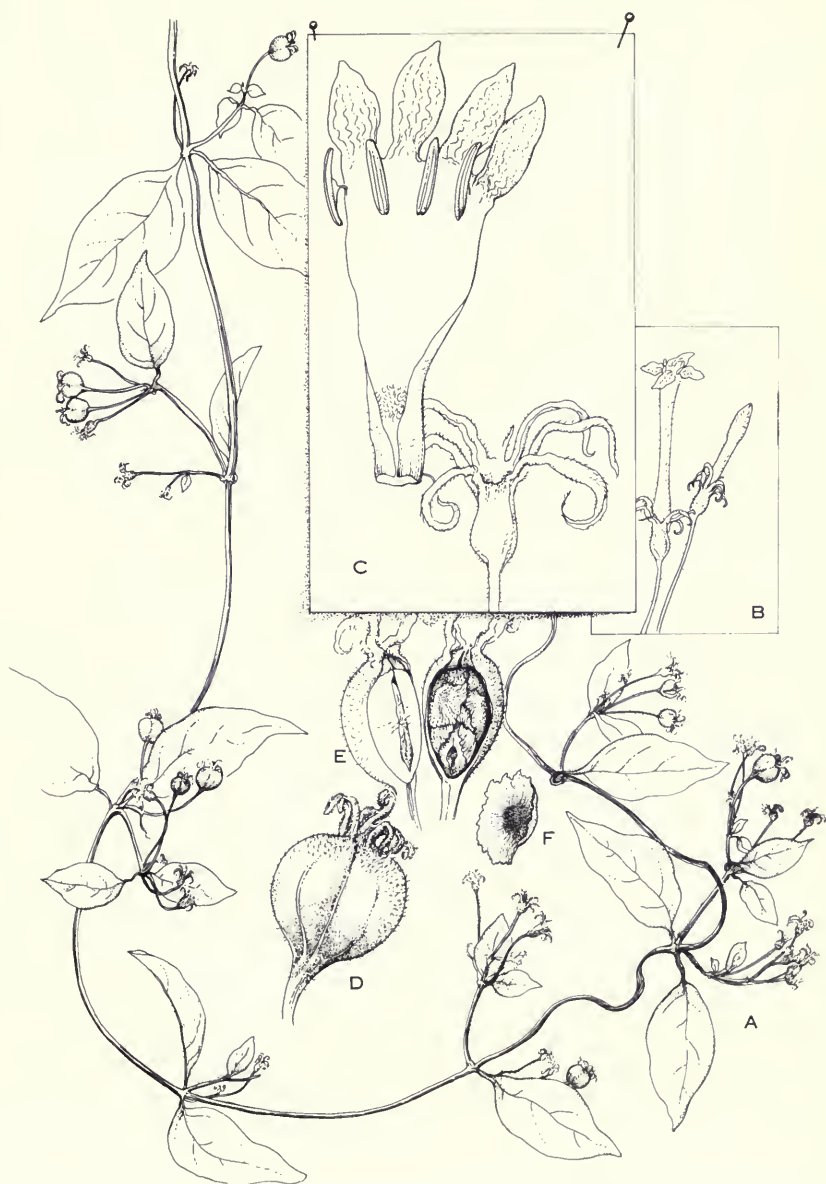


FIG. 12. *Manettia reclinata*. A, habit, $\times \frac{1}{2}$; B, bud and opened flower, $\times 1 \frac{1}{2}$; C, flower dissected showing hypanthium, calyx, and corolla, $\times 2 \frac{1}{2}$; D, capsule, $\times 6$; E, capsule dissected, $\times 2 \frac{1}{2}$; F, seed, $\times 4$.



FIG. 13. *Alseis yucatanensis*. A, flowering branch, $\times \frac{3}{4}$; B, flower, $\times 5$; C, hypanthium, calyx, and pistil, $\times 10$; D, corolla dissected, $\times 5$; E, details of fruiting and flowering inflorescences, $\times 1$.



FIG. 14. *Hillia tetrandra*. A, flowering branch, $\times \frac{1}{2}$; B, branch in bud showing early caducous stipules, $\times \frac{1}{2}$; C, flower partially dissected, $\times 1$; D, capsule segments, $\times \frac{1}{2}$; E, seed $\times 3$.



FIG. 15. *Cosmibuena matudae*. A, flowering branch, $\times \frac{1}{2}$; B, portion of corolla, $\times \frac{1}{2}$; C, fruiting branch, $\times \frac{1}{2}$; D, seed, $\times 20$; E, Dr. Eizi Matuda (for whom this species was named) from a photograph taken in the field in Mexico in 1961 when Prof. Matuda, one of the best known and most active Mexican botanists, was 65 years old. He is still an active botanist at 80!



FIG. 16. *Calycophyllum candidissimum*. A, flowering branch, $\times \frac{1}{2}$; B, flower, $\times 2 \frac{1}{2}$; C, corolla dissected, $\times 2 \frac{1}{2}$; D, segment of inflorescence showing bracts, hypanthium, and style, $\times 2 \frac{1}{2}$; E, fruiting cyme, $\times 2 \frac{1}{2}$.



FIG. 17. *Exostema mexicanum*. A, fruiting branch, $\times \frac{1}{2}$; B, inflorescence at anthesis, $\times \frac{1}{2}$; C, portion of a cyme with one flower partially dissected, $\times 2 \frac{1}{2}$; D, ovary with hypanthium and calyx, $\times 2 \frac{1}{2}$; E, base of corolla showing filament tube, $\times 3$.



FIG. 18. *Hintonia standleyana*. A, branch, $\times \frac{1}{2}$; B, dissected corolla with style and stamens, $\times 1 \frac{1}{2}$; C, fruiting branch, $\times \frac{1}{2}$; D, half of capsule showing septum, $\times 1 \frac{1}{2}$; E, seeds from one locule, position same as D, $\times 1 \frac{1}{2}$; F, seed, $\times 3$.



FIG. 19. *Coutarea hexandra*. A, flowering branch, $\times 1$; B, fruiting branch, $\times \frac{1}{2}$; C, capsules showing dehiscence, $\times 1$; D, seed, $\times 1$.



FIG. 20. *Uncaria tomentosa*. A, branch, $\times \frac{1}{2}$; B, segment of inflorescence, $\times 1$; C, flower, $\times 9$; D, flower dissected, $\times 9$; E, fruiting inflorescence, $\times 1 \frac{1}{2}$; F, capsules showing dehiscence, $\times 2 \frac{1}{2}$; G, seed, $\times 6$.



FIG. 21. *Cephalanthus occidentalis*. A, flowering branch, $\times 1 \frac{1}{4}$; B, inflorescences, one in bud the other at anthesis, $\times 1 \frac{1}{4}$; C, flower and anther dissected, $\times 5$.

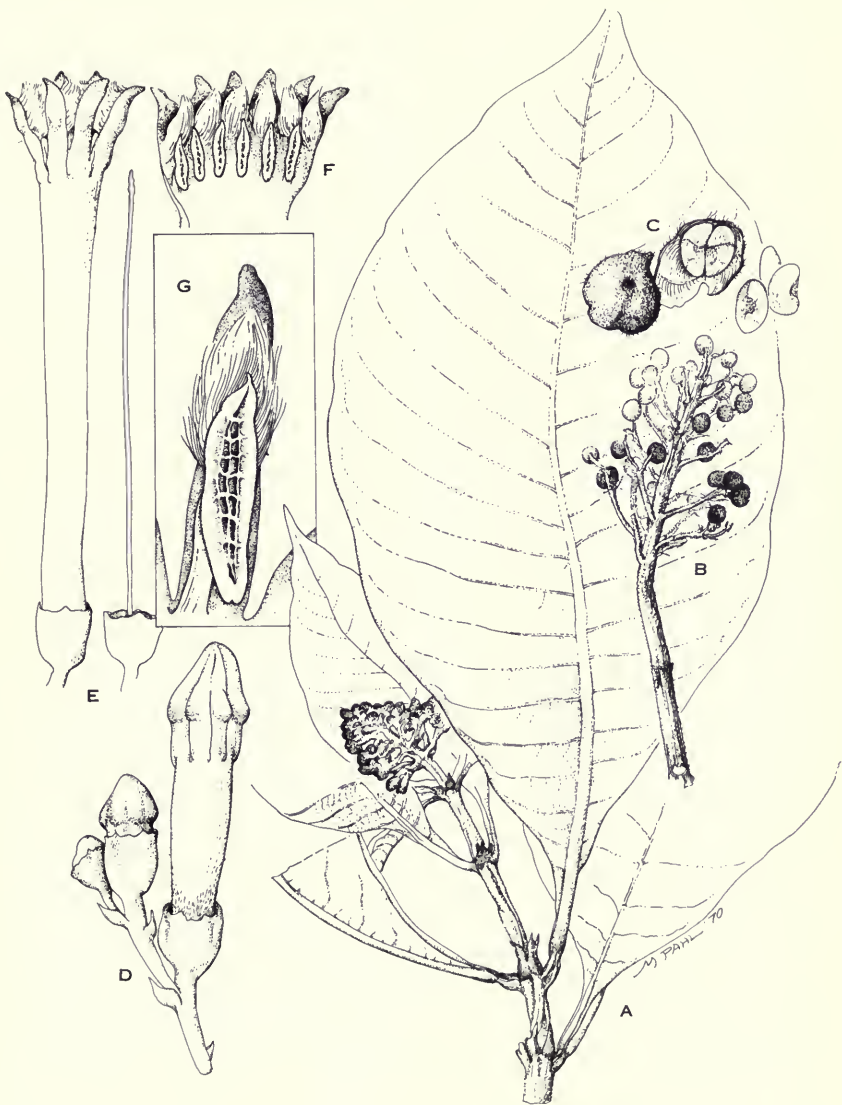
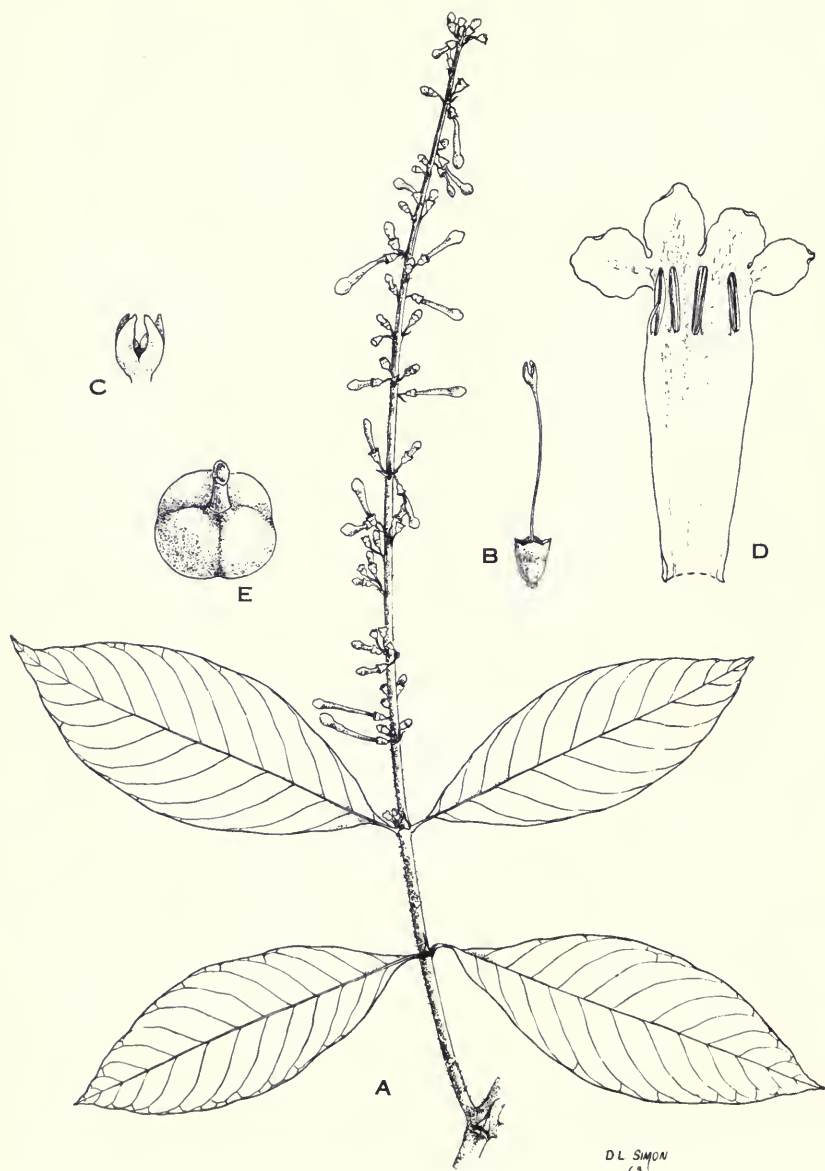


FIG. 22. *Isertia haenkeana*. A, flowering branch, $\times \frac{1}{2}$; B, fruiting inflorescence, $\times \frac{1}{2}$; C, fruits and seeds, $\times 2$; D, segment of inflorescence in bud, $\times 3 \frac{1}{2}$; E, flower with corolla, anther with corolla removed, $\times 2 \frac{1}{2}$; F, detail of apex of dissected corolla, $\times 5$; G, anther to show sculpture on inner face, $\times 10$.



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FIG. 23. *Gonzalagunia thyrsoides*. A, branch, $\times \frac{1}{2}$; B, calyx and pistil, $\times 2$; C, stigmas, $\times 5$; D, corolla dissected, $\times 2$; E, fruit, $\times 3$.



FIG. 24. *Coccocypselum cordifolium*. A, habit, $\times \frac{1}{2}$, with detail of pubescence; B, flower and anther dissected, $\times 2 \frac{1}{2}$.



FIG. 25. *Sabicea villosa*. A, habit, $\times \frac{1}{2}$; B, flower, $\times 4$; C, flower dissected to show detail, $\times 5$; D, mature capsule, $\times 4$; E, seeds, $\times 5$.



FIG. 26. *Sommeria guatemalensis*. A, branch, $\times \frac{1}{2}$; B, portion of under surface of leaf enlarged to show pubescence and veinlets; C, bud to show aestivation, calyx dissected away to show summit of ovary, $\times 3$; D, flower, $\times 3$; E, corolla dissected to show detail, $\times 3$; F, style, $\times 3$; G, stamen, $\times 5$; H, diagram showing position of calyx lobes and stamens.

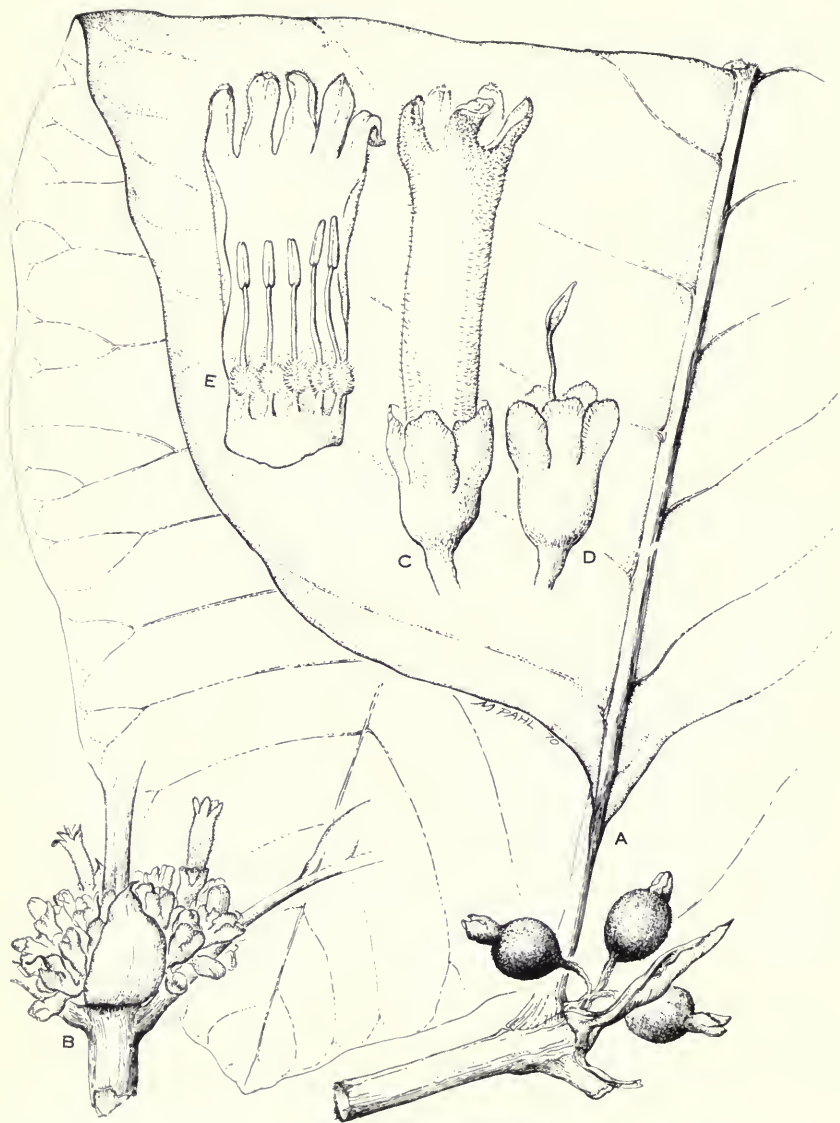


FIG. 27. *Pentagonia macrophylla*. A, leaf and fruits, $\times \frac{1}{2}$; B, inflorescence, $\times \frac{1}{2}$; C, flower, $\times 1 \frac{1}{2}$; D and E, flower dissected to show detail, $\times 1 \frac{1}{2}$.

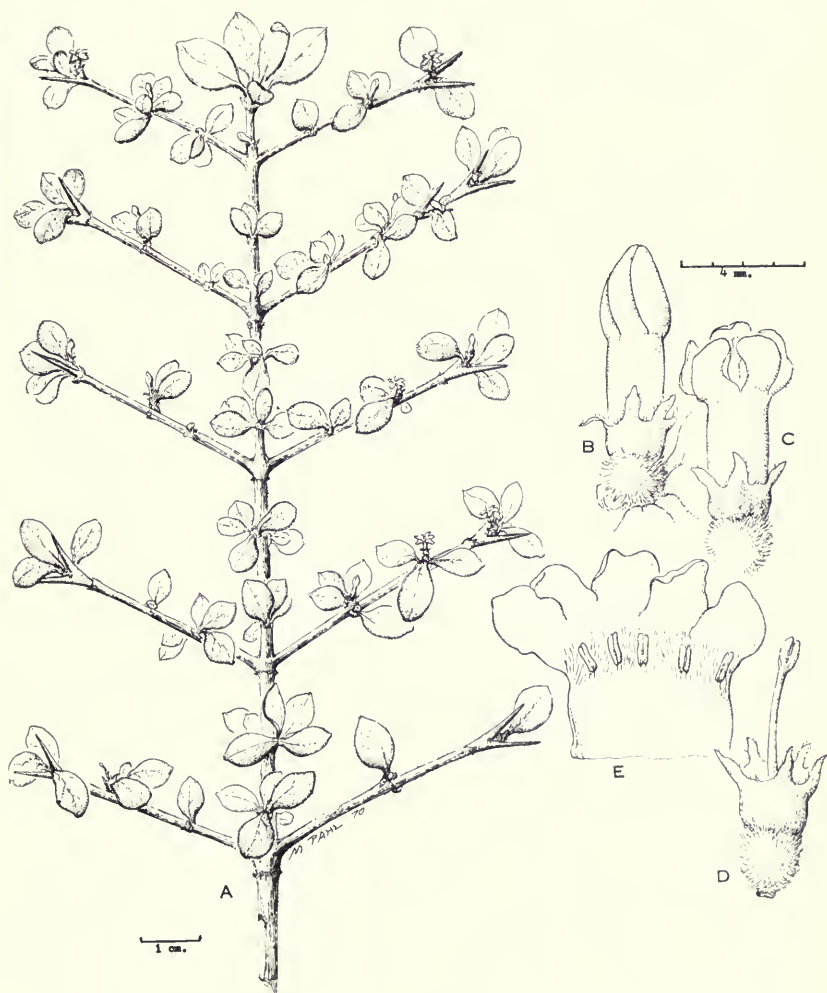


FIG. 28. *Randia standleyana*. A, flowering branch, $\times \frac{1}{2}$; B, flower to show aestivation, $\times 7 \frac{1}{2}$; C, flower at anthesis, $\times 7 \frac{1}{2}$; D and E, flower dissected to show detail, $\times 7 \frac{1}{2}$.



FIG. 29. *Posoqueria latifolia*. A, portion of flowering branch, $\times \frac{1}{2}$; B, flower partially dissected to show stamens and length of style, $\times 1$; C, anther front and side, $\times 5$; D, mature fruit, $\times \frac{1}{2}$.

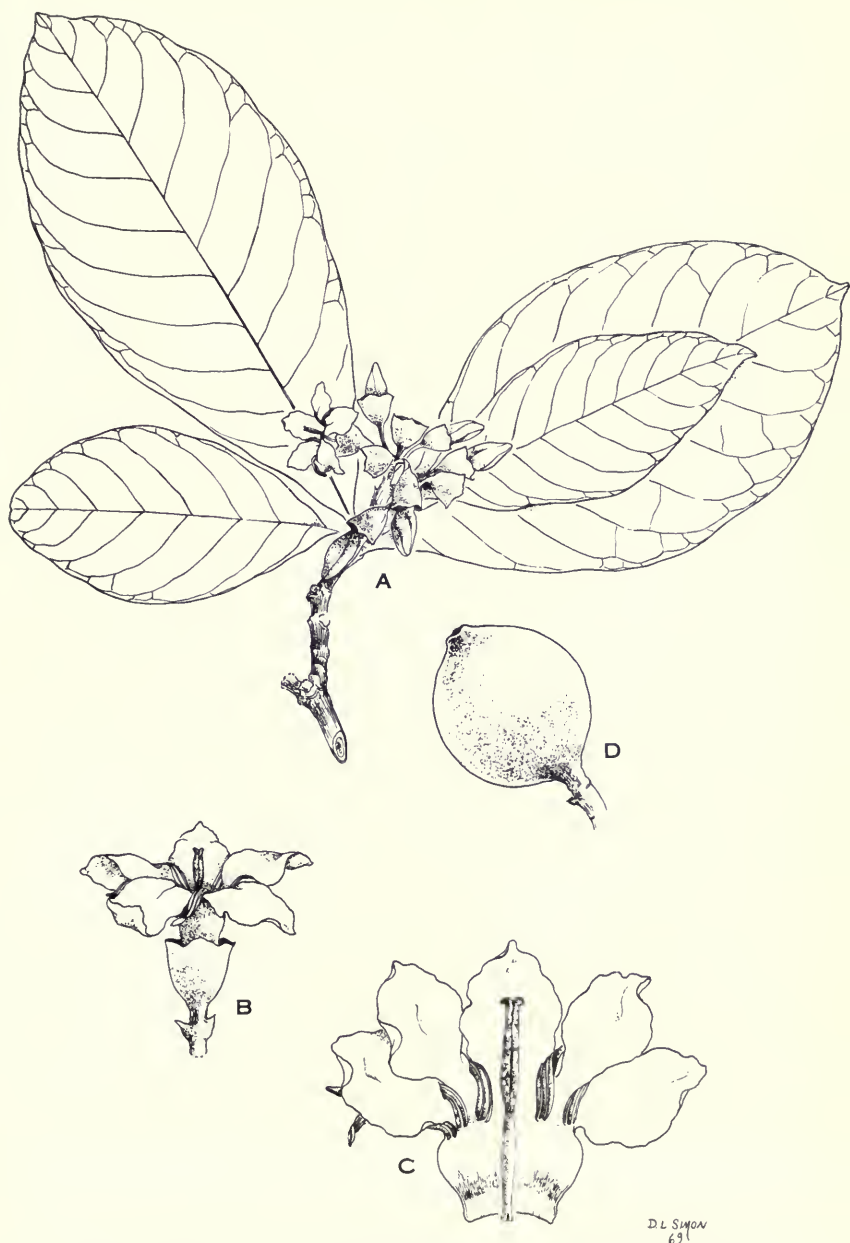


FIG. 30. *Genipa caruto*. A, flowering branch, $\times \frac{1}{2}$; B, flower, $\times 2$; C, corolla dissected with style in position, $\times 1 \frac{1}{2}$; D, fruit, $\times \frac{1}{2}$.



FIG. 31. *Amaiouia corymbosa*. A, flowering branch, $\times \frac{1}{2}$; B, flowers and bud, $\times 2 \frac{1}{2}$; C, flower dissected, $\times 2 \frac{1}{2}$; D, fruits, $\times 1$.



FIG. 32. *Alibertia edulis*. A, flowering branch, $\times \frac{1}{2}$; Aa, fruiting branch, $\times \frac{1}{2}$; B, hypanthium, calyx, and style, $\times 2$; C, corolla dissected, $\times 2$; D, anther, $\times 2 \frac{1}{2}$.



FIG. 33. *Bertiera guianensis*. A, flowering branch, $\times \frac{1}{2}$; B, corolla dissected to show anthers, $\times 5$; C, hypanthium, calyx, and pistil, $\times 5$; D, portion of fruiting inflorescence, $\times 1$.



FIG. 34. *Hamelia barbata*. A, flowering branch, $\times \frac{1}{2}$; B, bud, $\times 2 \frac{1}{2}$; C and D, flower dissected to show detail, $\times 2 \frac{1}{2}$; E, inner face of anther, $\times 4 \frac{1}{2}$; F, nearly mature fruits, $\times 1$.

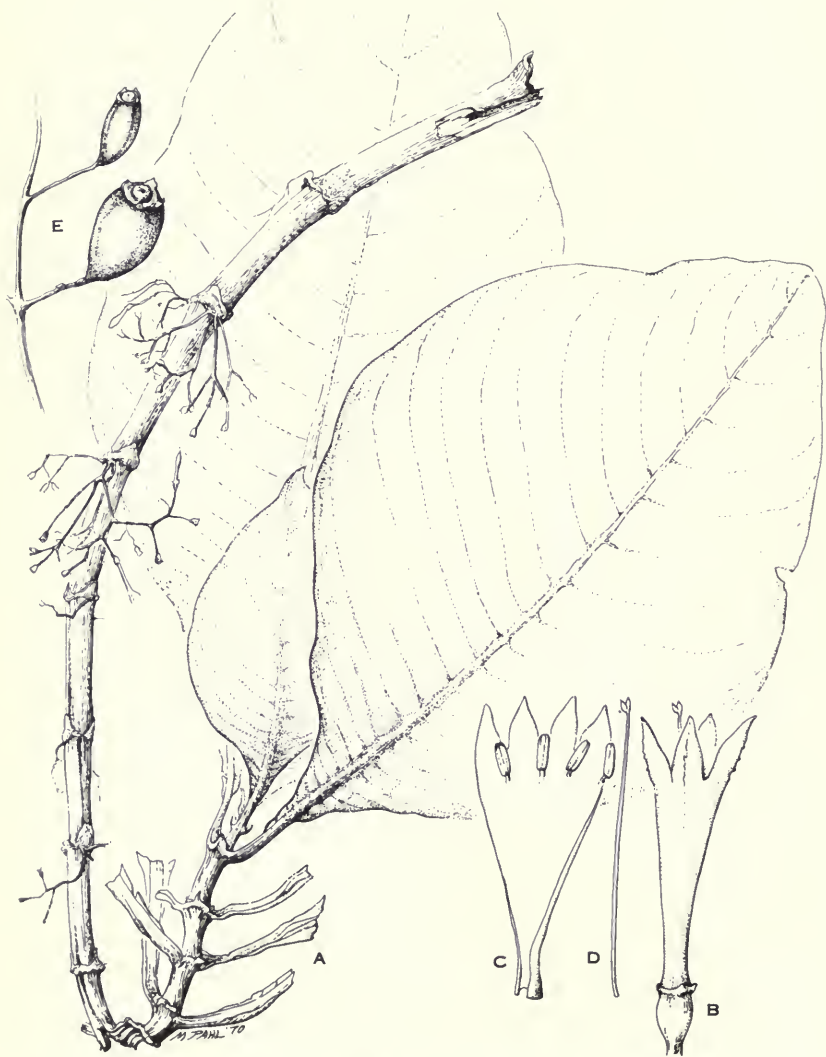


FIG. 35. *Hoffmannia cauliflora*. A, apical half of plant (with leaves removed) with inflorescences at nodes from which leaves have fallen, $\times \frac{1}{2}$; B, flower, $\times 2 \frac{1}{2}$; C, corolla dissected, $\times 2 \frac{1}{2}$; D, style, $\times 2 \frac{1}{2}$; E, mature and immature fruits, $\times 2 \frac{1}{2}$.



FIG. 36. *Hoffmannia sessilifolia*. A, variation in leaves, $\times \frac{1}{2}$; B, flower and dissection of flower, $\times 1 \frac{1}{2}$. From type.



FIG. 37. *Guettarda macrosperma*. A, flowering branch, $\times \frac{1}{2}$; B, portion of a cyme with one flower dissected to show detail, $\times 2 \frac{1}{2}$; C, fruits, $\times 1$.



FIG. 38. *Antirhea lucida*. A, flowering branch, $\times \frac{1}{2}$; B, flower and dissected flower, $\times 5$; C, portion of fruiting inflorescence, $\times 1$.



FIG. 39. *Pittoniotis trichantha*. A, branch, $\times 1$; B, fruiting inflorescence, $\times 1$; C, flowers, $\times 6$; D, flower dissected to show detail, $\times 7 \frac{1}{2}$.



FIG. 40. *Anisomeris brachypoda*. A, flowering branch, $\times \frac{1}{2}$; B, flower and dissection of a flower, $\times 5$; C, fruit, $\times 3$.



FIG. 41. *Machaonia lindeniana*. A, branch in flower, $\times \frac{1}{2}$; B, flower, $\times 7 \frac{1}{2}$; C, calyx, apex of ovary, and style, $\times 9$; D, corolla dissected showing anthers and segmented hair, $\times 9$; E, segment of fruiting inflorescence showing enlarged, chartaceous calyx lobes, $\times 5$.



FIG. 42. *Chiococca semipilosa*. A, flowering branch, $\times \frac{1}{2}$; B, flower and dissection of flower, $\times 3 \frac{1}{2}$; C, detail of fruiting inflorescence, $\times 1 \frac{1}{4}$; D, fleshy fruit from side and from edge, $\times 3$.



FIG. 43. *Asemnantha pubescens*. A, flowering branch, $\times 1$; B, detail of fruiting inflorescence, $\times 1\frac{1}{2}$; C, detail of flowering inflorescence, $\times 1\frac{1}{2}$; D, flower, $\times 5$; E, flower dissected, $\times 5$.



FIG. 44. *Chione guatemalensis*. A, flowering branch, $\times \frac{1}{2}$; B, flower, $\times 2\frac{1}{2}$; C, flower dissected, $\times 3$; D, portion of fruiting branch, $\times 3$. Drawn from the type.



FIG. 45. *Coffea arabica*. A, branch with immature fruits and flowers, $\times \frac{1}{4}$; B, partially dissected segment of inflorescence, $\times 5$; C, cross-sections of fruits, $\times 1$; D, seedling, $\times \frac{1}{2}$.



FIG. 46. *Ixora nicaraguensis*. A, fruiting branch, $\times \frac{1}{2}$; B, flowering branch, $\times \frac{1}{2}$; C, flower, $\times 4$; D and E, flower dissected to show detail, $\times 4$.



FIG. 47. *Psychotria chiapensis*. A, flowering branch, $\times \frac{1}{2}$; B, fruiting branch, $\times \frac{1}{2}$; C, inflorescence in bud, $\times 1$; D, flower, $\times 2 \frac{1}{2}$; E, stylodopodium with calyx and base of style, $\times 2 \frac{1}{2}$; F, portion of dissected corolla to show anthers and style, $\times 3$; G, anthers side and front, $\times 6$; H, fruit, $\times 1 \frac{1}{2}$.



FIG. 48. *Psychotria marginata*. A, flowering branch, $\times \frac{1}{2}$; B, flower in natural position and one dissected to show detail, $\times 10$; C, anthers from front and side, $\times 20$; E, fruits, one dissected, $\times 4$; F, the artist complains to the junior author about the low rate of pay, $\times \frac{1}{20}$.



FIG. 49. *Palicourea galeottiana*. A, flowering branch, $\times \frac{1}{2}$; B, stipule enlarged; C, fruiting branch, $\times \frac{1}{2}$; D, flower showing aestivation, and one in anthesis, $\times 5$; E and F, flower dissected to show detail, $\times 6$.



FIG. 50. *Rudgea cornifolia*. A, branch, $\times \frac{1}{2}$; B, interpetiolar stipule, $\times 2$; C, buds with flower at anthesis, $\times 6$; D, bud, calyx, and style, $\times 6$; E and F, flower dissected to show detail, $\times 6$; G, portion of fruiting inflorescence, $\times 1$; H, fruit, $\times 2$.



FIG. 51. *Declieuxia fruticosa* var. *mexicana*. A, habit, $\times \frac{1}{2}$; B, section of stem, $\times 2$; C, portion of fruiting inflorescence, $\times 2 \frac{1}{2}$; D, capsules from the top, side, and edge, $\times 5$; E, segment of inflorescence, $\times 4$; F, hypanthium, calyx, and style, $\times 6 \frac{1}{2}$; G, corolla dissected, $\times 6 \frac{1}{2}$.



C. E. Planch. del.

CEPHAELIS GLOMERULATA, n. sp.

B. Merrill, Lith. Boston

FIG. 52. *Cephaelis glomerulata*. Illustration number 1 from the Botanical Gazette for 1891 used by permission of the University of Chicago Press. Magnifications may be calculated from the text.



FIG. 53. *Mitchella repens*. A, habit, $\times \frac{1}{2}$; B, fruiting branch, $\times 1 \frac{1}{2}$; C, flower dissected to show detail, $\times 4$; D, flowers and leaf from an Arkansas specimen, $\times 2 \frac{1}{2}$. Figures A-C from a Guatemalan specimen.



FIG. 54. *Coussarea imitans*. A, flowering branch, $\times \frac{1}{2}$; B, immature flower, $\times 4$; C, hypanthium, calyx, and style, $\times 4$; D, corolla dissected, $\times 4$; E, mature flower, dissected, $\times 2 \frac{1}{2}$; F, portion of a fruiting inflorescence, $\times \frac{1}{2}$; G, fruits from the side and the edge, \times about 1.



FIG. 55. *Faramaea occidentalis*. A, fruiting branch, $\times \frac{1}{2}$; B, portion of inflorescence at anthesis, note both 4- and 5-lobate corollas in same inflorescence, $\times \frac{1}{2}$; C and D, dissections to show detail, $\times 1 \frac{3}{4}$; E, mature fruit, $\times 1 \frac{3}{4}$.

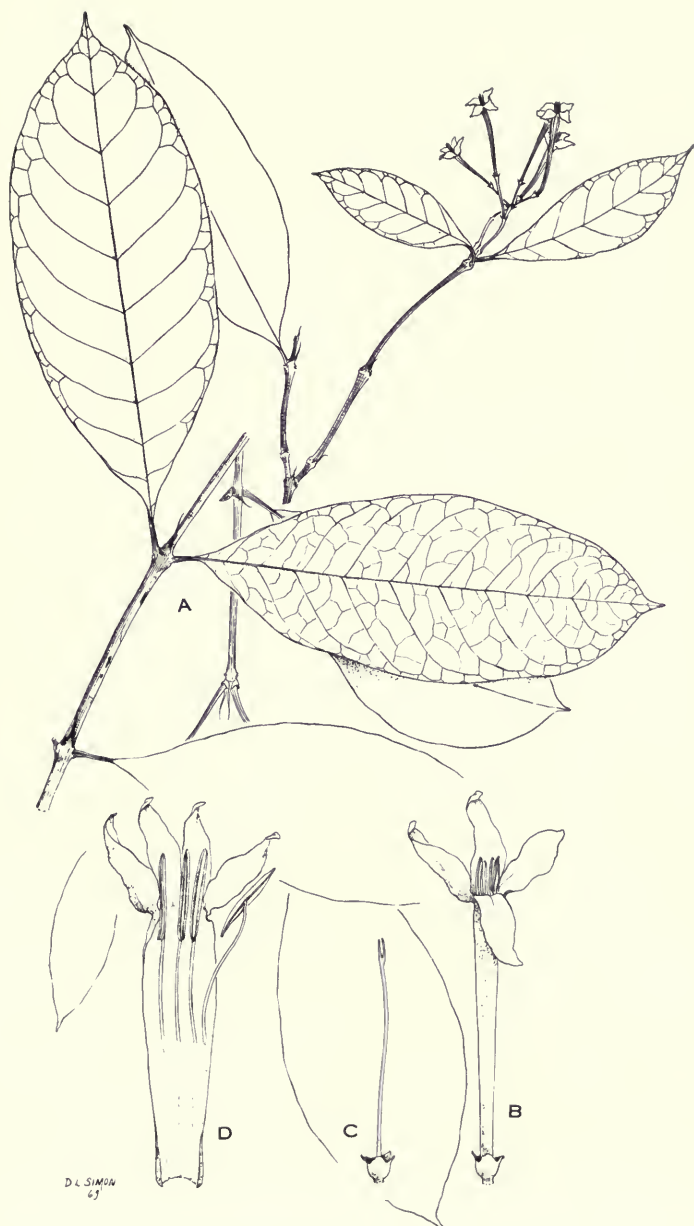


FIG. 56. *Faramea standleyana*. A, portion of flowering branch, $\times \frac{1}{2}$; B, flower, $\times 2$; C and D, dissections to show detail of flower, $\times 2$.



FIG. 57. *Appunia guatemalensis*. A, flowering branch, $\times \frac{1}{2}$; B, mature fruits, $\times 1$; C, a flower, $\times 2 \frac{1}{2}$; D, hypanthium, calyx, and style, $\times 4$; E, dissected corolla showing anthers, $\times 4$.



FIG. 58. *Morinda yucatanensis*. A, flowering branch, $\times \frac{1}{2}$; B, inflorescence, $\times 1 \frac{1}{2}$; C, part of inflorescence to show calyx, $\times 2 \frac{1}{2}$; D, corolla dissected, $\times 3 \frac{1}{2}$; E, style, $\times 3 \frac{1}{2}$; F, enlargement of undersurface of leaf to show pubescence.



FIG. 59. *Richardia scabra*. A, habit, $\times \frac{1}{2}$; B, section of stem to show stipule, $\times 2 \frac{1}{2}$; C, an inflorescence with subtending bracts outlined, $\times 1 \frac{1}{2}$; D, flower, $\times 4$; E and F, flower dissected to show detail, $\times 5$; G, tricoccous ovary, $\times 4$; H, locules of ovary from front and back, $\times 4$.



FIG. 60. *Ernodea littoralis*. A, fruiting branch and flowering branch of this strand plant, $\times \frac{1}{2}$; B, detail from fruiting branch, $\times 4$; C, flower in natural position and one partially dissected to show detail, $\times 4$.



FIG. 61. *Crusea calocephala*. A, habit, $\times \frac{1}{2}$; B, interpetiolar stipule, $\times 1 \frac{1}{2}$; C, flower, $\times 4$; D, E, and F, flower dissected, $\times 4$.



FIG. 62. *Diodia*. *D. sarmentosa*: A, branch, $\times \frac{1}{2}$; B, flower, $\times 5$; C, flower dissected, $\times 5$; D, capsule, capsule with one carpel removed and inner face of seed, $\times 4$; E, node and stipule, $\times 2$. *D. brasiliensis* var. *angulata*: F, branch, $\times \frac{1}{2}$; G, node and stipule, $\times 3$; H, hypanthium and calyx, $\times 10$; I and J, flower dissected, $\times 7 \frac{1}{2}$.



FIG. 63. *Hemidiodia ocymifolia*. A, branch, $\times \frac{1}{2}$; B, flower, $\times 7 \frac{1}{2}$; C, hypanthium and calyx, $\times 6$; D, inner face of one locule, $\times 6$; E, both faces of seed, $\times 6$.



FIG. 64. *Borreria laevis*. A, habit, $\times \frac{1}{2}$; B, flower, and corolla dissected, $\times 10$; C, two views of seed, $\times 7 \frac{1}{2}$; D, stipule, $\times 5$.



FIG. 65. *Spermacoce riparia*. **A**, branch, $\times \frac{1}{2}$; **B**, mature fruit and fruit dissected to show both cocci, $\times 7$; **C**, flower, $\times 10$; **D**, flower dissected to show trilobate corolla and bilobate calyx, $\times 12 \frac{1}{2}$; **E**, fruits with two and three calyx lobes.

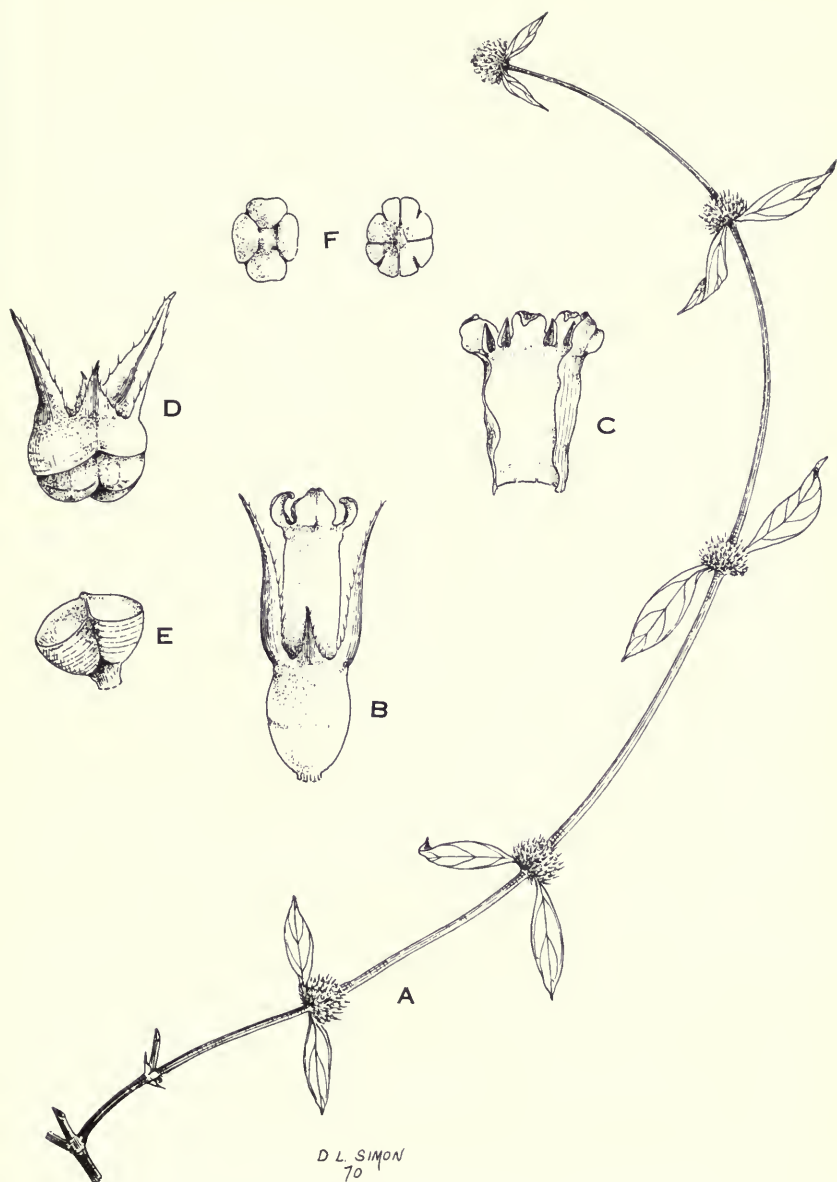


FIG. 66. *Mitracarpus hirtus*. A, branch, $\times \frac{1}{2}$; B, flower, $\times 8$; C, corolla dissected, $\times 10$; D, calyx and part of ovary showing dehiscence and seeds in place, $\times 8$; E, base of ovary showing cells and dehiscence, $\times 8$; F, seeds showing two faces, $\times 10$.



FIG. 67. *Relbunium hypocarpium*. A, habit, $\times \frac{1}{2}$; B, flowering branch, $\times 1 \frac{1}{2}$; C, portion of fruiting branch, $\times 1 \frac{1}{4}$; D, flower, $\times 10$; E, summit of ovary, much enlarged; F, flower dissected to show details, $\times 15$; G, capsules, $\times 3$; H, seeds, $\times 5$.



FIG. 68. *Didymaea* in Guatemala. *Didymaea hispidula*: A, habit, $\times \frac{1}{2}$; B, fruits, $\times 2 \frac{1}{2}$, from the type. *Didymaea microflosculosa*: C, flowering branch, $\times 2$; D, stipules and partial dissection of flowers, $\times 7 \frac{1}{2}$; E, corolla from above showing lobes and stamens, $\times 7 \frac{1}{2}$. *Didymaea australis*: F, portion of fruiting branch, natural size.

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